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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Bureau Congress.

Considerable interest is being evinced among the Branches of the Agricultural Bureau in the forthcoming Congress to be held in Adelaide from September 8th to 10th inclusive. The proposed banquet on the evening of September 8th to celebrate the silver jubilee year has met with general approval, and delegates and other members are securing tickets daily. Early application is necessary to obtain these, as arrangements with the caterers must be made some little time before the date. Full particulars may be obtained from the Secretary to the Advisory Board of Agriculture, Adelaide. His Excellency the Governor and the Minister of Agriculture will be present and deliver addresses. The opportunity will be taken to present the Certificates of Life Membership to members of the Bureau.

Conference of Hills Branches, Agricultural Bureau.

The Annual Conference of the Hills Branches of the Agricultural Bureau will be held at Mount Barker on October 13th. The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) has been invited to open the Conference, and the Director of Agriculture (Mr. Wm. Lowrie, M.A., B.Sc.), the Horticultural Instructor (Mr. Quinn), and the Government Veterinary Lecturer (Mr. F. E. Place) have been requested to address the Conference. Practical papers will be read by delegates from some of the Hills Branches of the Bureau.

British Exports of Live Stock.

In a booklet issued by the British Board of Agriculture relating to the exportation of live stock from the United Kingdom, it is shown that far and away the greatest trade is done in horses. During 1911 (the latest figures available) about 19,000 horses were exported from British farms and studs at excellent prices. The Argentine bought 269 British-bred horses at an average price of £178 each, for instance, while the 13 that went to Sweden averaged £250 each. On the whole, the hackney would appear to be the most of the demanded breeds, and, with the hunter, make up the majority of the exported horses. The best exported cattle go to the Argentine to improve the great beef herds. During 1911 the Argentine bought 243 head for £20,910, while, as a contrast, Austria-Hungary bought 551 for £9,476. The United States, the largest customer, bought 772 for £25,209.

Black-Nosed Cattle.

Everybody knows, writes the *Agricultural Gazette*, that the old wild white breeds of cattle, such as the Chillingham, had black muzzles, and though breeds had been improved from them, the black muzzle remained, until the general improvement of the last century so gradually established breeds vastly better, and in course of time the black nose, as indicating the older type, was bred and weeded out. Yet there are plenty of farmers living who remember when they had to cull the black-nosed cattle and speckled-face sheep from lots they bought, because they knew that they were really unimproved and that they were bound to be unprofitable. To-day the same thing merely indicates a cross between recognised breeds, and all that is necessary is to be able to recognise what those breeds are, and to buy or refuse them as they think they are suitable for the purposes to which they will be put.

A Maize Experiment.

The East Anglian Institute of Agriculture, at Chelmsford, in 1912, held some experiments with maize. The following varieties were tested :—White Cap Yellow Dent, Longfellow, Angel of Midnight, Quebec Yellow, Champion White Pearl, Improved Leaming, Eureka, Wood's Northern Dent, White Horse Tooth, Giant Caragua. The first eight were Canadian and American seed. The last two were purchased at Reading. The maize was ploughed in on May 16th. The seed was sown at the rate of 2bush. per acre, and in rows 20in. apart. A dressing of 10 tons dung, 1cwt. nitrate of soda, 3cwts. superphosphate, and ½cwt. sulphate of potash per acre was given. The following conclusions were reached :—(1) Many of the above varieties are capable of producing a very heavy weight of fodder per acre. The yield, as compared with 1911, showed a great increase, which was attributed to heavier rainfall and to better tilth. (2) The first five varieties are fairly equal in cropping capacity, and did well both in 1911 and 1912. (3) In 1911 Improved Leaming, Wood's Northern Dent, and Eureka gave the best yields, and they cropped well in 1912 also. (4) The superiority of the Canadian and American seed in 1911 was not maintained in 1912. (5) It is important to cut maize at the right time. This seems to be just before the male flower fully appears from the sheath. Sutton's Early Prolific was sown with the rows at 24in., 20in., 16in., and 8in. apart respectively. The experiment showed that (1) the largest crop is obtained from the narrowest rows, and (2) that rows at 20in. apart are much more profitable than at 24in. It is pointed out, however, that in making rows closer than 20in. other factors must be considered, namely, the large amount of seed required, and the difficulty of horse-hoeing, which is very important in a dry season.—*Agricultural Gazette.*

South America as a Market for Apples.

The June number of *The Fruit World of Australasia* contains an interview taken from a New Zealand daily with Mr. Thomas Horton, of the firm of Messrs Thomas Horton, Limited, nurserymen, of the Dominion, in regard to the market for fruit in the Argentine. Mr. Horton paid a visit to the Argentine for the purpose of inquiring into the subject, and as a result he declares that there is practically an unlimited market there for fruit. "One firm," he states, "gave me a definite order for 200,000 cases of apples, to be shipped each year for five years during the months of March, April, May, and June, and stipulated that if we were unable to supply that quantity during the next few years we were to send every case that we could possibly muster if we could supply them at 6s. 6d. per case, f.o.b." The varieties of apples said to be in greatest favor with the Argentine importers are Jonathan, Cox's Orange Pippin, Scarlet Nonpariel, Rome Beauty, Cleopatra, Dunn's Favorite, Ben Davis, Rokewood, and Reinette du Canada.

Adaptability of Breeds.

In selecting a dairy breed it is not a matter of which is the best breed, but the one best suited for prevailing conditions. Select with a view to adaptability and for the purpose for which the animal is kept. Some breeds are noted for the quantity of milk they produce, others for the richness of their milk, others for the color of cream or butter. All these things must be taken into consideration before selecting a breed. Of the dairy breeds the Holstein has a number of high producing animals. They point with pride to such animals as Colantha 4th Johanna, with a record of over 1,100lbs. of butter in the year, and the late queen of the dairy world, Banastine Belle De Kol, with a record of over 1,300lbs. of butter in 365 days. The Jersey has Jacoba Irene, the Guernsey Dolly Dimple, and the Ayrshire Netherhall Brownie, all of which were a credit to their respective breeds.—*American Agriculturist.*

Methods with Potatoes in Russia.

Depth of planting potatoes appeared to make little difference, in some Russian tests, as the yields following planting to depths of 1¼in. to 5¼in. were almost equal. The four-year average yield secured from planting the transverse halves was somewhat greater than the three-year average secured by the use of the longitudinal halves. Both were excelled by the four-year average resulting from the use of whole tubers. In dry years the yield from the halves was considerably lower than that secured by the use of whole tubers, but in wet years the reverse was the case. In the dry year of 1909 the making of hills proved injurious, but in the wet year of 1908 it appeared advantageous. Planting potatoes 14in. apart in tests at the Uman Agricultural School were practically equal to those secured by planting 17½in. apart each way during a five-year period, and somewhat greater than those secured by planting 21½in. apart each way during six years or 28in. during four years. In wet years planting 21in. apart each way was followed by the higher yields, while in dry years 14in. apart each way appeared the best distance. In the rather wet year of 1908 potatoes planted 21in. apart each way on ridges gave lower yields than those planted in furrows, but the usual method of planting gave considerably better results than the use of either furrows or ridges. In the dry year, 1909, however, the best yields were obtained by planting on ridges.

Marketing Farm Produce.

The most important item in marketing is to present produce in attractive form and in an attractive package. Purchasers have no way of judging the quality of the goods except by appearance, and often an inferior article tastefully presented will meet with a more ready sale than a superior article poorly presented, simply because it is more attractive to the eye. The seller must have a good reputation before buyers will be on the lookout for him and his produce.

Keep Time on the Dairy Herd.

Factories and big offices use a time clock which registers the minute each employé comes in, and again when he leaves. Thus there is no guesswork about the hours put in, and each receives the proper amount of pay for his work. Can you think what it would mean, says *The American Agriculturist* if you could keep track of the work your dairy cows do in some such way ? If one was a shirk you could fire her out, and if one did extra good work you could give her more feed. If you kept this up for a generation or two, saving the good ones and getting rid of the poor ones, your herd would improve, wouldn't it ? And after awhile you could have it so that every animal was working full time and paying the proper sort of profit. Successful dairymen everywhere are doing that very thing. Instead of a clock it is a pair of scales. They are adjusted to just balance an empty pail, so the milk reads direct, without any subtraction. A ruled sheet with a column for each cow is tacked on the wall near by, and a pencil is handy. It takes but a moment to drop the bucket on the hook, mark down the weight, and be gone again. At the end of the month, and again at the end of the year, it stands there in black and white. Why don't you try that way of improving the stock ? Don't do it if you mean to sell out in a year or two ; it's too much trouble. But if you are in the business to stay and make good, buy a pair of spring scales and a penny lead pencil, borrow a sheet of paper, and start in.

Why Fertilisers Failed.

"Many farmers expect entirely too much of commercial fertilisers," says an authority. "They forget that the physical condition of the soil is often just as important as the supply of available plant food. The condition of the soil depends largely upon the amount of decaying organic matter it contains. By it clay soils are kept loose and well aerated, are more easily drained, and at the same time capable of holding more water in an available form. They have less tendency to surface washing, heaving, and extremes of temperature when well supplied with organic matter. Sandy soils are made more compact, more retentive of moisture and plant food. In all soils the acids produced by the decay of organic matter are the chief agents in getting into usable form the plant food locked up in their insoluble mineral particles. If disappointing results attend the use of fertilisers, it is well for the farmer to ask himself if he has made sufficient use of barnyard manure, heavy sods and green manuring crops, in maintaining the supply of organic matter of the soil."

New Experiments on the Fertilsing Property of Sulphur.

Experiments, states the June number of *The Fruit World*, have been made to ascertain whether flowers of sulphur have any effect on the growth of barley and rye. The experiments were carried out in the experiment garden of the Agricultural Institute at Nancy, in a very rich clay soil after beets. The soil analyses gave an average sulphuric acid content of 0·082 per cent. It is well known that most soils are poor in sulphuric acid, the amount varying, according to Hart & Petersen, from 0·033 per cent. to 0·14 per cent., almost always remaining below 0·10 per cent. The sulphuric acid present in the experimental soil was thus an average amount. The sulphur was applied before sowing (at about ¼oz. per square yard, or 90lbs. per acre). The sowing was done on February 25th, 1912. The favorable effect of the sulphur showed itself from the beginning in the stronger growth and brighter green of the plants on the treated plots. This result persisted till the crops ripened. The crop reaped on July 26th was weighed (grain and straw together). The average weight per plot of 2 sq. m. (2·4 sq. yds.) was as follows :—

	Barley.	Rye.
	lbs.	lbs.
Without sulphur	13·0	9·5
With sulphur	16·5	12·75
Increase due to sulphur	3·5	3·25

These figures clearly show the good effect of sulphur upon the cereals used for the experiment.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. Place, B.V.Sc., M.R.C.V.S., Government Veterinary Lecturer.)

The Mangalo Branch inquire the cause of a young calf, two days, losing use of its legs, eyes turning white, shivers; calf seemed in good health. Another calf sucked mother cow before her own was born.

Reply—The symptoms are altogether too indefinite to venture an opinion on, but it is possible that the animal's heart had not undergone the changes which occur at birth.

"G.B.S.," Dunira recently bought a cow supposed to be in calf, which has a discharge of blood from the bearing about every three weeks. He asks for advice.

Reply—The symptoms described suit several diseases of the generative system, and there is a risk that in your case the cow is suffering from contagious abortion, and has already slipped her calf, so that it would be well to let a veterinary surgeon examine her. In the meantime isolate her from the rest of the herd, and syringe her out with a pint of warm water containing 1 L.G.B. Soloid B. & W., and repeat three times at three-day intervals. Also give her once as a drench ¾lb. Epsom salts and 1oz. ginger in a quart of warm beer. Follow this with 10 drops of veterinary tincture of pulsatilla daily for a week.

"M.," Stockport, has found that after castration with the emasculator by different men there is a swelling of the purse which is permanent. He asks for advice.

Reply—The emasculator is not to blame. A sufficiently large cut was not made in the outer skin, and the wound healed too quickly so that the discharges were retained in the inner skin, making a "wind stone," or the colts were cut too proud, as the inquirer says, "only half castrated." This was the case in the one which did not swell for two years. The instrument is often blamed for the operator's work. It has made the operation so easy that every farmer can do it for himself if he will only cut a very large hole in both outer and inner skins and cut the cord above the pride.

"Bletchley" reports that a young cow was killed after a few days illness which resembled lockjaw without the closing of the jaws. The bible was large and hard.

Reply.—It is usual to find the bible at third stomach large and hard, both in health and disease. Probably water was as scarce as feed was said to be, and the illness was caused by the absorption of poisonous residue from the feed, so-called "dry bible." Three pounds oats and 6lbs. chaff daily is starvation ration for a cow giving 2½galls. of milk a day.

The Arthurton Branch asks for advice concerning a mare which for the last three months frequently almost goes down, stamps, and bites on flank; worms are feared.

Reply.—Worms, bots, and internal abscesses all produce the symptoms mentioned, and probably all three help to cause the trouble in this case; while sand is also very probably present also. Treat for bots first; after a few days give a course of Fowler's solution for worms, as so frequently recommended lately, but do not be surprised if one day the mare goes down finally with a ruptured bowel caused by accumulations in the large gut. This is a case requiring the personal examination of a qualified veterinary surgeon before the real cause of the symptoms can be stated.

HORTICULTURE.

"H.B.," Beetaloo Valley, inquires regarding growing cherries in his district.

Reply.—The Horticultural Instructor (Mr. G. Quinn) writes in reply—*Re* cherries.—If you have a number of varieties which bloom simultaneously and still no fruits result, I would feel pretty well certain the non-productive character of your trees could be attributed to unsuitability of general soil and climatic conditions. Truly, the cherry is only a real success in South Australia over a very limited range of country in the Mount Lofty hills, and, personally, I do not think they will ever pay you to grow in the North, even if you obtained a shilling per pound for the fruits. I know of no stone fruit for which the cherry affords a suitable stock on which to graft. If you root them up, open a good hole, and plant pears or some fruit trees quite dissimilar to a stone fruit. *Re* Beurre Clairgeau pears falling.—This is a characteristic failing of this otherwise valuable variety. Fortunately in this case, although I cannot suggest how to keep the fruits on a tree of Beurre Clairgeau, you can graft the trees over to better varieties without a long delay preceding the reproductive period. I suggest you put on as grafts, Beurre Bosc, Madame Cole, or Packham's Triumph.

A Stirling West resident asks for information regarding "black spot" disease in walnuts and "bitter pit" in apples.

Reply.—The Horticultural Instructor writes—*Walnut Disease.*—The walnut disease causing defects in the nuts throughout the Mount Lofty Ranges is known as bacteriosis of the walnut. It is due to a bacterium. As far as is known no spray remedy is effective, as the germ, by methods not yet discovered, enters the sap, and is then out of reach of external dressings. All I can suggest is to gather all diseased fruits from the trees or ground from time to time and burn them. The disease also affects at times the terminal points of the young shoots. These turn pale and show distinct evidences of the effect of the germ in withered leaves, &c. Such points should be cut off and burnt. By following these precautions for a couple of seasons you have a chance of reducing the attack. *Bitter Pit.*—Bitter pit is a disease of the apple and pear fruits, which is not caused by any organism, but appears to arise through disorganisation of the sap flow and tissues fed thereby. It appears to be aggravated by heavy winter pruning, more especially by cutting back the leading shoots. I would advise light pruning and only thinning out lateral shoots the winter before you expect a heavy crop. Do not overwater or stimulate the trees with manure and allow the branches to take a pendulous rather than erect form.

"M.V.," Clarence Park, asks for advice concerning the non-setting of almonds on his Brandis trees.

Reply.—Mr. Quinn states—The Brandis almond is not a good bearer. I think this is due to the following facts :—(1) It blooms too early in spring to escape bad weather, and no other almond is blossoming with it to permit proper cross fertilisation of the blossoms. (2) Its foliage and fruits form just at the time when the shothole fungus is very active, and in consequence suffer much from the attack of this disease. The remedy for non-setting may consist in growing hardshells, or some early blooming sort, such as Peerless, with the Brandis ; and the shothole may be lessened by spraying the trees with Bordeaux mixture, made by dissolving 1lb. of bluestone in 5galls. of water and slaking 1lb. of fresh quicklime in 5galls. of water, and then blending the two together.

POULTRY.

(Replies supplied by Mr. D. F. LAURIE, Poultry Expert.)

"W. P. E." inquires the cause of some incubator-hatched chickens being cripples.

Reply.—Cripples occur as a rule through lack of moisture in the machine at time of hatching. You should test your thermometer. Borrow from a chemist a clinical thermometer and compare readings.

"J. R. D.," Mile End, is desirous of learning how to distinguish cockerels from pullets in the case of newly-hatched chickens.

Reply.—There are three points which distinguish the cockerel from the pullet in newly-hatched chickens, and if you note these you will make but few mistakes. They are as follows in order of value :—(1) Examine the vent and blow lightly. If a pullet, the sphincter muscles will contract several times, but rarely in the cockerel. (2) The comb on newly-hatched chickens is nearly always erect on the cockerels and lying flat on one side on the pullets. (3) The spur bud on the cockerel is large and more conspicuous than on the pullet in most strains.

"J. G. R." asks the temperature at which incubators should be worked, and also what added moisture is required ?

Reply.—You do not say what incubator you are using, so that I have nothing to guide me in my reply to your question. Instead of damping the eggs I should recommend you to dip a sponge, or a bit of flannel or old blanket, the size of the egg tray, dip it in hot water, squeeze it out, and spread it over the eggs. Do this two days before the eggs are due. It is important for you to be quite certain that the thermometer is correct.

"P. E." requires information as to the construction of poultry yards and houses.

Reply.—A yard 3ft. wide and 12ft. long will afford ample space for one male bird. At the end of the house there should be a small yard, and you should put plenty of straw and scratching material on the ground. For a yard 18ft. x 30ft. build a shed 18ft. long, 6ft. wide, with a division in the centre, so as to make two houses in each ; and then you can put 10 to 13 laying hens. Let them out on alternate days into the yard which occupies the remainder of the space. You should use jarrah posts, oregon rails, and galvanized iron for shed, and wire netting 6in. in the ground and 6ft. 6in. out of the ground. To get this you will require 4ft. and 3ft. netting. Your best plan for egg production is to build a house as I have described and yard for each of them 9ft. wide, the same width as the house, and 40ft. long ; 30ft. will do, but it is rather short.

SOME LOCAL ECTO-PARASITES OF POULTRY.

By D. F. LAURIE, Government Poultry Expert and Lecturer.

[Paper read before the Microscopical Section of the Royal Society of South Australia, May 27th, 1913.]

Following on my researches into the life history of the poultry tick (*A. Persicus*), the results of which were read before members of this society and published in Bulletin No. 74, it will be of great interest to poultry breeders to describe and illustrate other external or ecto-parasites which affect poultry and are found in this State. It is not my purpose to write either a history, or to make an attempt to classify and refer to all the species hitherto discovered here. I will content myself with a description and some account of the habits of such as are common, and of which I have collected specimens.

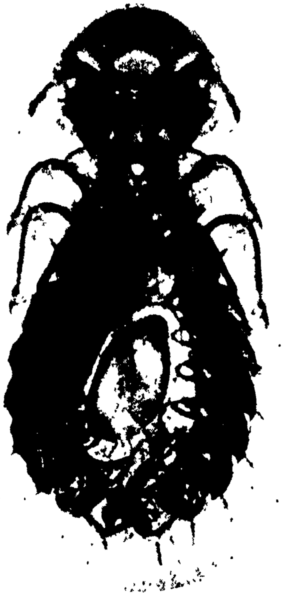

PLATE I.—*Goniocotes Gigas*, Taschenberg.
FEMALE, VENTRAL. X 26.

Quite apart from the fact that infested birds and poultry houses are attributable to great carelessness and neglect upon the part of the poultry keeper, there is the important consideration of the damage done and the frequent losses which occur and are due to ecto-parasites. Poultry which are infected by parasites (vermin) are prone to disease, because they become weak through loss of blood in some cases, and through the effects of irritation in other cases. The more recent view is that we must regard external parasites with grave suspicion as likely carriers and distributors of disease organisms. This is known to be the case in many instances, notably the poultry tick, which acts as carrier and distributor of a micro-organism, the spirochæte, responsible for the so-called poultry tick fever or spirochætosis.

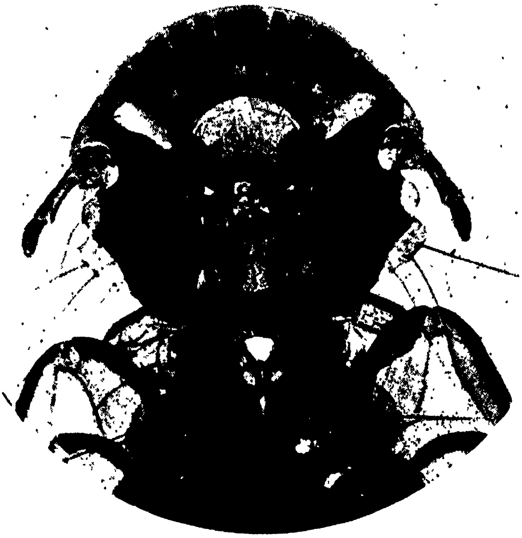

Plate II —*Goniocotes Gigas*, Taschenberg.
Head of Male, *vide* Plate I. × 74

An Erroneous Idea.

Some people labor under the erroneous idea that it is right and proper for all animals to harbor parasites. Many have the idea that parasites "breed," that is to say that they come from nothing, or perhaps from dirt—what is known, in fact, as spontaneous generation. This idea is quite wrong, and the idea of spontaneous generation was long ago exploded. Poultry which are infested with parasites have become infested by the parasite in the first case, or through an egg. A bird whose skin and feathers had been effectively sterilised would remain free of vermin for all time if kept under such conditions that infection from outside sources could be prevented.

The study of parasites and parasitism is becoming a very important one, and in all parts of the world scientific investigators are at work, studying the structure, habits, and general life history of the different species and subspecies.

The present work will relate to the animal parasites—lice, mites, &c. At some future time the vegetable external parasites, generally microscopic, will be referred to. The animal parasites, generally termed mites and lice by breeders, belong to the group *Arthropoda*, or jointed-limbed animals. They are again divided into the *Acarina* (mites) and the *Mallophaga* (lice).

The lice are true insects, but in a degraded form through the loss of wings. They live upon the skin, devouring its debris, and often causing lesions or sores. Others live upon the feathers, and sometimes cause a more unsightly appearance on the birds. The lice live permanently on the poultry, only leaving the body after death of the host, or, as most poultry men know, when the host—the infested bird—is handled. Mites and poultry fleas are only partial parasites, as they do not as a rule live on their host, but pay visits for the purpose of blood-sucking, &c. As a rule poultry lice are easily exterminated, and in this respect are not comparable with poultry tick. Dipping in any of the sheep dips, kerosine emulsion, and in numerous proprietary dips of which there are legion, is a cheap and effectual method of dealing with this pest, as, in addition to the parasites, their eggs also are destroyed. The most important point to observe is that all methods must be thorough. If birds are infested they must be dipped, and at the same time the poultry houses and roosting places generally must be thoroughly cleansed, and by the application of suitable agents the vermin and their eggs must be destroyed. It is futile to expect to eradicate vermin by methods commonly adopted, such as throwing about a few pounds of lime or a handful or two of sulphur, or by a half-hearted application of a little weak spray of some insecticide. In addition to vigorous measures, the provision of dust baths is to be commended. These should be under cover, and may consist of fine road dust, to which may be added wood ashes and a little sulphur. The fowls will, as a rule, frequently resort to these dust baths, and to rid themselves of the pests, which are smothered and destroyed by the fine dust. Some fowls do not avail themselves of the dust bath, and this is especially the case with male birds. At regular intervals the birds should be examined, and if infested in the slightest degree prompt measure should be adopted. When this advice is universally put into practice there will be far less heard of many diseases which at present cause great loss.

The general technical term *Phthiriasis* has been given to skin affections caused by lice. Poultry lice belong to the suborder of *Hemipterous* parasites. Neumann says, " These are small-sized (only a few millimetres in length), apterous insects, of a dull-white color, and the mouth of which is adapted either for pricking or masticating. The head bears two simple eyes, or *ocelli* (often but little distinct), and two antennæ, composed of three, four, or five articles. The three thoracic segments are more or less confounded with each other. The abdomen is generally composed of nine segments. The legs are ordinarily short and strong. The tarsi are formed of two articles, the last of which has two nails, or hooklets, by which the insect can creep. The eggs, called nits, are pyriform, have an operculum at one end, and are fixed very solidly to the hairs or feathers by a glutinous substance. The young, which leave the egg by the operculum, have quite the shape of the adults, and do not undergo any metamorphoses, though they only acquire their definitive color and consistency after several moultings.

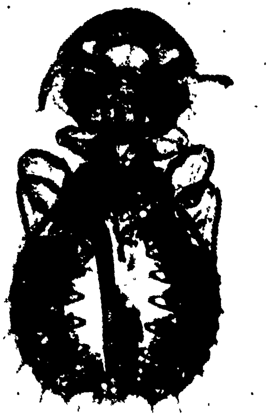

PLATE III.—*Goniocotes Gigas*, Taschenberg.

MALE, DORSAL VIEW. × 26.

MALE AND FEMALE.

The male and female differ from each other in the former being a little smaller than the latter, frequently by peculiarities in the antennæ, by the last abdominal segment being divided in the female and rounded on the male, which has also, on the middle line, a copulative apparatus of a brownish color, and are digitiform or lancet shaped. The males are usually much less numerous than the females.

Of the Hemipterous parasites there are two families, the Pediculidæ and the Ricinidæ. With the latter, or Mallophaga, we have now to deal. These have the buccal apparatus formed for mastication ; they are pellivorous in the matter of feeding, and live on the epidermic (skin) productions or upon the feathers (pennivorous). The pieces constituting the mouth are placed at the inferior (lower) surface of the head. The tarsi (end of legs) terminate in one or two claws. These mallophaga do not suck the blood, and are in some respects commensals as far as the scurf-eating species are concerned. The Ricinidæ, or Mallophaga, are divided into two subfamilies. The Philopterinæ, which have the antennæ composed of three or five articles, and have no maxillary palps, and two (the Liotheinæ) whose antennæ have four articles, and are provided with quadri-articulated maxillary palps projecting beyond the anterior border of the head. The Philopterinæ are divided into 11 genera, but of these only five are parasitic on birds, viz., Ornithobius, Lipeurus, Goniodes, Goniocotes, and Docophorus.

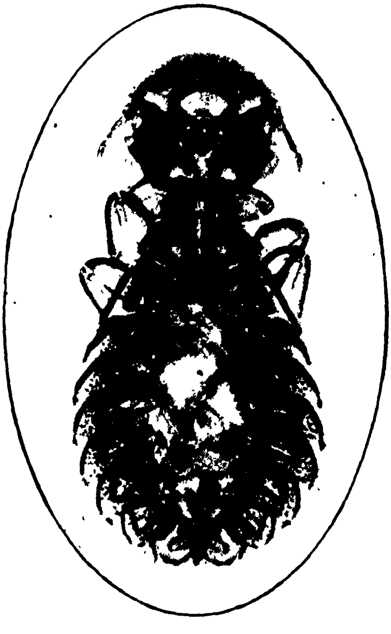

PLATE IV.—*Goniocotes Gigas*, Taschenberg.
FEMALE, DORSAL VIEW. × 26.

The Liotheinæ comprise 10 genera, of which the following are parasitic on birds, viz., Trinotons, Colpocephales, and the Menopons. As these are probably all in this State, they will each in turn be briefly referred to as the occasion arises.

COLLECTING SPECIMENS.

It will help the work of collecting information about local parasites if readers will kindly forward specimens to me for identification. The easiest method of procedure is to put a little ordinary methylated spirits in a bottle ; if a chemist is at hand, ask for the addition of a few drops of sulphuric ether. Take a small camel hair pencil, or a feather dipped in spirits and touch the parasite. This either kills or stupifies it, and it may then be transferred to the little bottle. Particulars of locality, and the kind of bird (fowl, duck, goose, turkey) on which it was found, and also, if possible, the part of the body should be given.

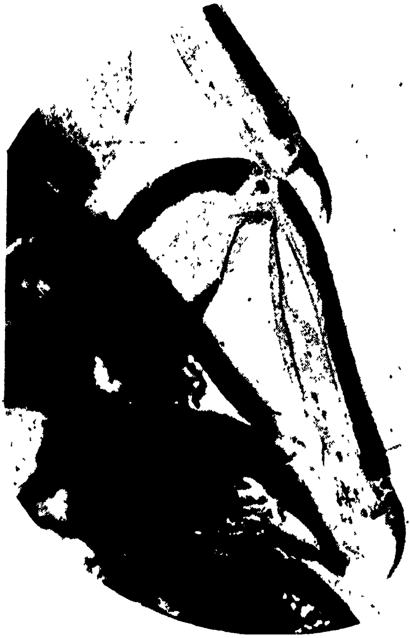

PLATE V.—*Goniocotes Gigas*, Taschenberg.
CLAWS, *vide* Plate I × 103.

The specimens are prepared by me and then mounted in xylol balsam on glass slips, and after identification are photographed by means of a Zeiss micro-photographic camera. By this means one gets a very greatly magnified picture of a parasite, so that the details of structure can be readily seen and understood.

Goniocotes Gigas, Taschenberg.

This belongs to the subfamily Philopterinæ, family Ricinidæ, suborder Phthiriases ; host, the domestic fowl.

This is the largest of the species of the Goniocotes, and is recognisable by its round and very large abdomen, as well as by its great size. The general color is light-yellow, the abdomen and metothorax are brighter colored, and the bands and outline of the spots are dark. The female is 4mm. and the male 3mm. long. The specimens here illustrated were whitish on the back, and the characteristic curved markings are almost black. This species is pellivorous, that is, it lives on the epidermis. Theobold records it as not very common in England, and that he has not seen it on the fowl. Neumann describes it and figures it. In the United States of America Department of Agriculture bulletin on Insects Affecting Domestic Animals it is mentioned, but the distinctive "gigas" is given as a synonym for *abdominalis*. Piaget. Curiously enough, the authors of the bulletin write, "It is the form commonly referred to in English and American works as *Goniocotes hologaster* which doubtless accounts for its not having been described until quite recently." Either this is quite wrong or else both Neumann and Theobold are wrong; these world-famed authorities figure "hologaster," which is a most markedly distinct species.

The species is not common in South Australia, and it is only during recent years that I have seen many specimens. The first collected came from some of the competition fowls sent to Roseworthy Poultry Station. They were collected by the Superintendent, and until I had time to properly identify them were variously classed by those who saw them as the duck louse (*Docophorus icterodes*), which they somewhat resemble at first glanc ; and others again said the pig louse (*Hæmatopinus urius*, Nitsch or *H. Suis*, Linn., which they certainly do not resemble. Later on other specimens came from various parts of the North. As a rule they were found on the feathers, stationary, and proved very slow in their movements. In bottles on feathers they lived only a few days, and died apparently of starvation.

The series of micro-photograph are from my own balsam mounts, and in each case there is considerable magnification. Any good insect powder dusted among the feathers will speedily destroy these insects. Dipping, as previously advised, may also be resorted to. So far I have no specimens of eggs of *Goniocotes gigas*.

DESCRIPTION OF PLATES (PHOTO.-MICROGRAPHS).

From original preparations made and photographed by the author.

Plate No. 1 shows a large female *Goniocotes gigas*, viewed ventrally (from the under side). Four of the six legs are shown slightly extended ; the third pair is only partly visible. The bristles on various parts of the parasite are also clearly depicted. Shows a characteristic rounding of the posterior portion of the body, and also the first articles of the antennæ, which are longer on the male than on the female. The strong legs and claws are well shown.

Plate No. 2 shows a much enlarged view of the head, and gives details of the antennæ, mouth parts, bristles, and portion of thorax. This is the head of parasite shown in plate 1.

Plate No. 3. A dorsal (looking down on the back or upper surface) view of the male *Goniocotes gigas*.

Plate No. 4 shows another female, dorsal view, slightly smaller than that shown in plate 1. This illustration well depicts the characteristic body markings of the species. Upper articles of limbs, the antennæ, bristles, and mouth parts are also clearly shown.

Plate No. 5. This plate shows a highly magnified view of the claws of the specimens shown in plate 1. Portions of the second and third pair of legs are seen, showing tarsi and hooklets. In the upper claw are seen the two articles, one of which is movable.

(To be continued.)

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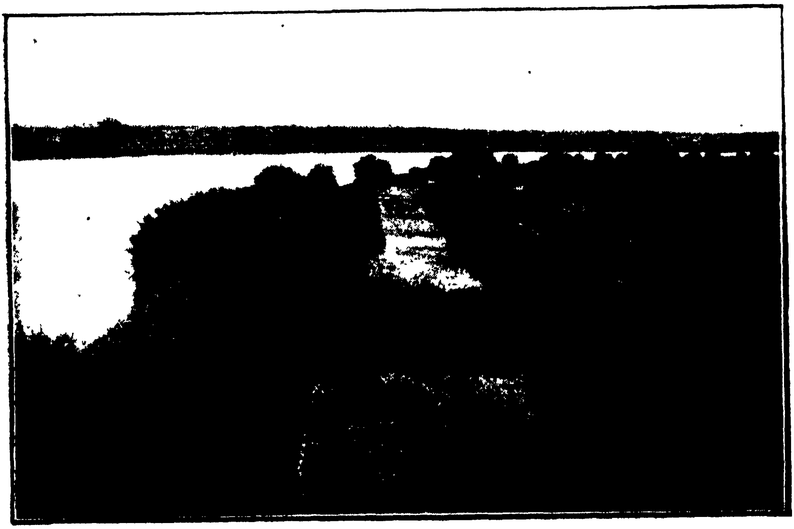

River Murray Reclamation Works.

BACTERIAL DISEASE OF POTATOES.

By T. G. B. Osborn, M.Sc., Professor of Botany, Adelaide University.

Specimens of potatoes infected with a bacterial disease having been received from Mount Compass, the following note has been written to give further information on the subject:—

Rotting of potatoes owing to the agency of bacteria of various species commonly follows such diseases as Irish blight when the infected tubers are stored. In the case of such a rot the bacteria are not the prime cause, but merely act as scavengers, destroying the tissues already attacked by other fungi. There are, however, at least two important diseases of potatoes which may be definitely ascribed to the action of bacteria infecting the growing plants.

Bacteria are simply-organised plants of very minute size. They act mainly as destroying agents, bringing about the destruction of waste animal and vegetable matter. A large number of species live in the soil, a cubic inch of which may contain many millions, and there they fulfil most useful functions. On the other hand, many species are parasitic upon animals, being very harmful to man, producing such diseases as diphtheria, typhoid, &c. In the last few years several species have been recognised as causing diseases of plants. Among the more important of these are *Bacillus amylovorus*, causing pear blight in the United States of America, but not yet recorded out of America, and *Pseudomonas campestris*, causing rot of turnips, cabbages, and other cruciferous plants. This latter occurs in the market gardens around Adelaide, and growers would do well to realise in time its serious possibilities as a destroyer of the various cruciferous crops, and burn infected plants rather than allow them to rot on the ground, so reinfecting it.

Of the two more important bacterial diseases of the potato, one, that known as "black-leg" or "black stalk-rot," has not as yet been brought to my notice in South Australia. McAlpine (1) records it in Victoria, but apparently in most seasons it is not common. In Europe it is much more serious; in Germany at times as much as 75 per cent. of the crop may be destroyed by it. The second disease is that recorded from Mount Compass, produced by *Bacillus solanacearum*, and is popularly known as "bacterial rot" or 'bacteriosis." McAlpine (2) records a number of popular names by which it is known in Victoria, of which "sore eyes" appears very expressive, as the eyes of the potato in the early stages of the rot are moist and the soil has a tendency to cling to them.

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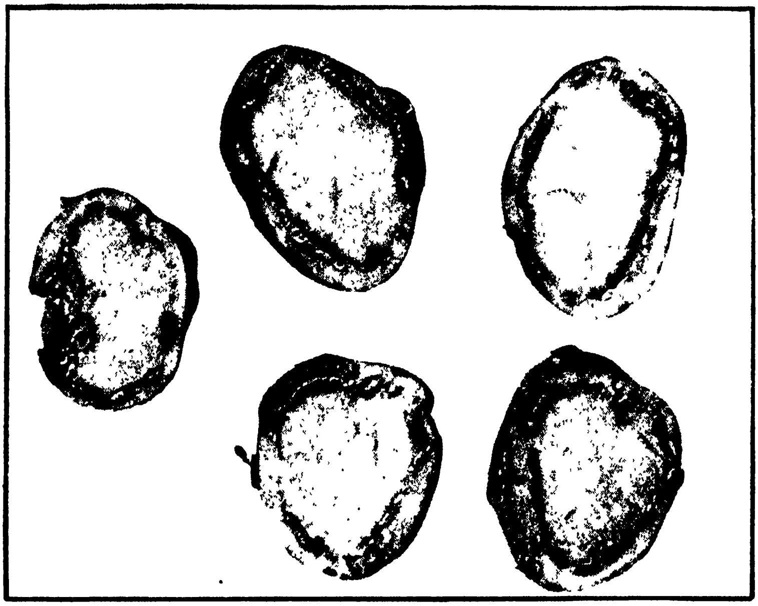
(1) McAlpine. D: Potato Diseases in Australia, 1911, p. 90.

(2) McAlpine, loc. cit., p. 87.

Appearance of the Disease.—The first sign of infection is stated to be a wilting and shrivelling of the leaves of the young potato plant. This is followed by a browning of the stem as the attack proceeds down the woody parts of the plant to the tubers.

In case of a slight attack, however, the disease is not usually observed by the grower until the crop is lifted. Then, in some of the tubers, a softening of the eyes is noticed. They appear moist and, as previously stated, the soil has a tendency to cling to them. If at this stage the tuber be cut across, there will be noticed an irregular brown ring about ¼in. below the skin following the position of the veins in the tuber. (See figure.) The bacteria are in these, and a turbid, greyish slime may be noticed exuding from their cut ends. The slime consists of countless numbers of bacteria.



Sections across potatoes infected with bacterial rot. Notice the discolored ring, in which can be seen white areas. These are slime masses, containing bacteria, that ooze from the cut ends of the veins. The section on the left has been cut in the region of an eye and shows an extension of the rot involving the flesh of the tuber. One-third natural size.

The rot proceeds, becoming most marked at the eyes and heel end of the potato. In a few days the whole tuber will be rotten, the flesh turning to a whitish-grey slime, which has an objectionable smell. It is often noticed that potatoes apparently sound when lifted rot shortly after.

Parasite.—The bacterium is a little rod-shaped organism. Like all bacteria it multiplies exceedingly rapidly by dividing into half. Each half divides again, and so on. By this process of division a single bacterium dividing once each half-hour may give rise to several millions at the end of a day.

Bacteria vary in their power of living in the presence of fresh air. The organism producing potato bacteriosis is aerobic, that is it needs a supply of fresh air, and this may account for the more rapid way rotting proceeds after the crop is lifted.

Cycle of Disease.—The leaves and stem of the plant are usually first infected. In some cases, though, infection appears to be due to bacteria present in the soil directly attacking the tuber. Dr. Smith (3) considers that rapid spread of the disease may be due to leaf cutting and punching insects feeding first on infected and then on healthy plants. The bacteria multiply in the wood vessels of the stem, thence by means of the underground stems into the tubers. The rot soon spreads from the veins until the whole of the tuber is involved. On the break up of the rotten potato the bacteria are scattered in the soil. It is probable that they can live there for some length of time. The disease is reported as sporadic in its occurrence in South Australia. Where it occurs the effects are most marked on damper parts of the field ; hence it is not surprising to find it largely on reclaimed swamp land.

Prevention.—It cannot be too clearly stated that in dealing with bacterial diseases the question is entirely one of *prevention.* As far as is known at present, no method of curing infected plants is possible where a bacterial disease exists in an annual crop. The growers' efforts can only be directed towards limiting the spread and preventing a recurrent outbreak.

1. All infected plants should be removed and burned as soon as they are observed.

2. Diseased potatoes and the tops of infected plants should on no account be left to decay on the land. This only saves up trouble for the future by keeping the disease in the soil. Diseased portions should always be burnt.

3. Potatoes should never be planted in infected soil. It is reported that the disease may occur on the same land after several years.

4. Care should be exercised to obtain clean seed, and no tuber showing a brown ring when cut should be used.

5. Drainage and spraying both indirectly help to reduce the amount of the disease, since the dampest spots are the most affected, and by spraying, the leaf-puncturing insects are kept in check.

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(3) mith, E. F., Dept. Agric., United States, Am., Divis. Veg. Phys. & Path. Bull. 12 1896.

DISEASES OF FARM ANIMALS.

RESPIRATORY DISEASES OF CATTLE—*continued.*

By R. H. F. MACINDOE, L.V.Sc., Assistant Veterinary Surgeon, Stock Department.

(*Continued from page* 1367.)

PLEURISY.

This is an inflammation of the lining of the chest cavity, which also envelopes the lungs. As a rule it is rarely found as a distinct disease, but is generally a complication accompanying pneumonia.

Predisposing Causes.—Exposure to cold or wet, blows, fractures of ribs, &c.

Symptoms.—In first stages great pain is shown on moving, the animal is usually stiff, and the breathing is abdominal, being usually accompanied by a short grunt. The chest is fixed so far as possible, the indrawn breath is short and jerky, and elbows turned out. The pain is due to the friction of the dry inflamed pleural surfaces of the lung and chest on each other. Pressure between the ribs causes the animal to flinch and grunt. Muzzle hot and dry, temperature 104° to 106° F. In a few days the temperature falls to 103° F., pain decreases, stiffness disappears, and the patient eats a little. Gradually the animal loses strength. The latter symptoms are brought about by internal changes taking place, the dry condition of the lining membrane having undergone a change and become moist. Now, if one lays an ear against the chest wall, gurgling sounds are heard every time the animal breathes, and by tapping the chest with the fingers he will get horizontal lines of dullness according to the amount of fluid present. As the disease progresses the animal shows a haggard appearance, and the eyes appear to be sunken. Unfavorable cases end in death in from 10 to 21 days.

Treatment.—The same general care is required as recommended for bronchitis. Combat the fever by giving sweet spirits of nitre, 1oz., concentrated solution of acetate of ammonia, 1oz., in half a pint of water two or three times a day. When fluid is forming in the chest, apply strong mustard paste to chest walls, and the following can be given internally three times a day, viz., tincture digitalis, 1oz., potassium iodide, ½ dram. Sometimes fluid is removed from chest cavity to relieve the heavy breathing, but would not recommend the layman to attempt it.

Pneumonia.

This is an inflammation of the lung itself. There are three forms, but as they can only be distinguished one from the other by the practitioner, I will treat the subject under the one heading.

Causes.—Bacterial mainly, but the disease may also be brought on by careless drenching, parasites, and may also follow an attack of bronchitis.

Symptoms.—Usually the disease is ushered in by a chill, which may not always be observed by the attendant. An elevation of temperature is observed, usually 105° to 107°. The breathing is quick and shallow, nostrils dilated. Cough may be present, nose dry, tongue may be slimy. Urine is usually high-colored and scanty, and bowels constipated. On tapping the sides of thorax with fingers, the sounds are practically normal at this stage. In the second stage the temperature generally drops a few degrees, and breathing is very difficult. Cough is frequent and painful. Animal stands with forelegs wide apart and elbows turned outward. If lying down, the animal rests on brisket. Milk secretion is suspended. Extremities hot and cold alternately. On sounding the chest wall by tapping, dull areas are found, showing consolidated areas in lung. In the third stage if the disease is going to terminate favorably the cough becomes looser, the animal's appetite returns, and all symptoms gradually subside. In fatal cases the breath becomes fetid and is taken in gasps, the extremities become clammy and cold, and death takes place.

Treatment.—The animal must be placed in clean, healthy surroundings and carefully nursed. The probability of recovery depends largely on the area of lung involved, as well as the degree of inflammation present. In early stages when fever is high give sweet spirits of nitre and solution of acetate of ammonia in same doses as prescribed for pleurisy. If bowels are constipated give calomel, 1 dram to 3 drams. In second stage diffusible stimulants are indicated, such as the following :—Spirits of sweet nitre, 2ozs.; aromatic spirits of ammonia, 1oz. ; mix, and give in gruel three times a day ; or an alcoholic stimulant such as brandy or whisky in half-pint doses may be given three times a day. Rub on the chest walls such medicaments as mustard or turpentine, ammonia liniments.

DISEASES FOLLOWING PARTURITION (CALVING).

Retention of Afterbirth.

The cow is especially liable to this accident, partly on account of the peculiar connection between the womb and the fetal membranes, the fetal membranes being attached to the walls of the womb by buttonlike processes called "cotyledons."

Causes.—Low condition of health, imperfect power of contraction. Sometimes a temporary retention is caused by a too rapid closure of neck of womb after calving, which causes a strangulation or imprisonment of the membranes.

Symptoms.—As a rule the membranes can be seen hanging from the passage, but in other cases the membranes are not seen; but animal is noticed to strain frequently, and there is a passage of fluid varying in consistency according to the state of retained membranes, and generally a strong fetid smell. Tail becomes matted with the material. At first the temperature may be normal, but gradually it rises to 103° to 104°; animal goes off her milk, muzzle dry, and animal shows general uneasiness.

Treatment.—Before recommending lines of treatment it is necessary for the owner or attendant to understand that absolute cleanliness is essential, not only in regard to their own persons, but also the same rule applies to utensils, water, &c., used. The animal should be placed in clean surroundings. If the retention is due to insufficient contractible power of womb due to weakness of animal, contraction may be brought about by giving warm gruels, hot mashes, &c., without any medicines being required. A simple purgative drench may be given, containing 1lb. Epsom salts with ½lb. of treacle in a quart of lukewarm water. The removal of membranes by mechanical means is, however, often called for, and there are many methods of so doing.

A common practice among cattleowners is to tie stones, bricks, horseshoes, pieces of wood, &c., to the protruding membranes in order to get them away; but this method is to be condemned, not only on grounds of unsightliness, but also on account of the danger of causing an eversion of the womb itself, and also that the membranes may be in a gangrenous state, and by this indiscriminate dragging apart may break away and a part may be left in womb. There is another method often used, in which the dependant part of the afterbirth is caught between two sticks and then rolled until it lies against the passage, and by careful traction accompanied by slight jerking movement the womb is stimulated to contract and expels the membrane, which in turn is again wound around the sticks until the whole of membrane is delivered. But this method has the same objection as with the first, on account of liability of membrane breaking.

The best method is to remove the afterbirth by hand. First clean hands and arms thoroughly, smear with carbolised oil or some such similar preparation, and, whilst an assistant holds tail out of the way, the operator should hold afterbirth in left hand and insert the right hand in womb, and pass it along until it reaches the points of attachment of the membrane, when gentle traction must be exerted and the afterbirth comes away freely from the passage. After the operation is completed, irrigate the womb with a warm solution of Condy's fluid, which serves to allay any irritation and acts as a disinfectant. The strength of Condy's solution is gauged by the color, which should be of a violet tinge. Keep the animal quiet, and put on good diet, but not too much grain.

METRITIS (Inflammation of Womb).

The degree of inflammation varies, it may be slight or violent, simple, or associated with putrefaction of its liquid contents and general poisoning.

Causes.—Bruising and laceration during difficult calving, infection by retained afterbirth, and also infection by introduction of attendant's arm which has not been thoroughly washed and cleaned before so doing; also exposure to cold and wet.

Symptoms.—Generally appears from one to three days after calving, when the animal may be noticed to shiver, hair along spine is rough and staring, and the horns, ears, and limbs are cold. Temperature 103° F to 104° F., appetite is lost, milk diminished, and breathing hurried. Hind limbs may shift uneasily, tail is switched from side to side, head and eyes turned to right flank, and a grinding of teeth is heard. Pressure on right flank causes pain, shown by moaning or grunting. The womb appears inflamed, and may be swollen, and there may be a blood-tinged discharge, which later may become thick and yellow. Some cases recover quickly, may be well again in a couple of days, but a large number perish within 48 hours, whilst other cases may gradually recover, taking a fortnight to three weeks. In the worst cases there is local septic infection and ulceration, and there may be gangrene of the parts, and in other cases inflammation of veins of womb, which causes a clotting of blood in them, and a small portion of clot may become detached and find its way to heart or lungs, in the latter case causing pneumonia.

Treatment.—In the slight cases, where there is only a simple inflammation, washing out the womb with warm solutions of carbolic acid and water, using a teaspoonful of carbolic acid to the quart of water or solution of alum and water, two tablespoonfuls of alum to pint of water, will often be found to be efficacious. In severer cases wash out the passage with warm water to which Condy's crystals (½oz. to 2pts. of water) and 1oz. each of glycerine and laudanum has been added, which makes an antiseptic and soothing douche. It is usually desirable to keep the bowels open by giving Glauber's salts (8ozs. in 2pts. of water) with little treacle and 1oz. ginger.

In the very septic cases, *i.e.*, those cases which have a high temperature and yellow-colored fetid discharge, give besides the foregoing such agents as quinine 2 drams, salicylate of soda ½oz., or hyposulphite of soda 1oz. every four hours. If temperature should rise as high as 106° or 107°, apply cold water to body. The animal may be covered by wet sheets and water poured on until temperature per rectum (anus) is 102°. If in winter, will have to rub animal dry and rug.

In septic cases the attendants must for their own protection be very particular as to state of hands and arms, seeing they are free from cuts and sores, are clean, and protected before being passed into womb by applying an oil containing some disinfectant, such as carbolic acid, lysol, &c.

MILK FEVER.

This disease is fairly common, and usually occurs 24 to 48 hours after calving, though cases have been known to occur up to three weeks after, and is manifested by a sudden loss of consciousness and a general condition of paralysis.

Cause.—The actual cause unknown.

Predisposing Factors.—There are many conditions which favor this disease, such as age of the cow, most animals being affected generally between the age of 5 and 10 years old. The condition of animal plays an important part, inasmuch that animals in gross condition, good doers, and heavy milkers are very prone to the disease. The kind of food and mode of feeding it is another important factor. Well-nourished cows which are being liberally fed as the time for calving approaches, especially with green fodder, are very liable to the disease. This disease is only found in connection with calving, and never before the establishment of milk secretion. Cows which have had difficulty at time of calving are seldom attacked.

Symptoms.—The first symptom noticed is the animal is off food, is restless, and now and then emits a dull bellow. Then a weakness may be noticed in hind quarters, by the animal being inclined to trip and knuckle over at fetlocks, and finally tumbling to ground. As a rule, however, the symptoms the attendant first notices is that the animal is down, with head turned to the left flank and unconscious, or may be the animal is lying on its side. When the attendant approaches and examines the animal, he notices that the eyes are staring and dilated, and if touched give no response ; also the head when lifted is inert, and goes back to the same position when released. In some cases, however, the animal swings its head in a mechanical kind of way, and may grunt or moan. The rest of the body has the same paralysed appearance. Long strings of saliva may be seen coming from the mouth, due to inability of animal to swallow owing to paralysed state of the throat. The bowels and bladder are usually in the same state, but in slighter cases may not be affected. The temperature is normal, *i.e.*, about 102°. Breathing is slower, but in some cases there is a heavy stertorous respiration. Shortly put, the animal appears to be in a deep sleep.

Treatment.—Some cases recover in a half to one hour without any assistance, but very few. The best mode of treatment is the injection of air into the dder after it has been rendered pure. There are many apparatus for this purpose on the market which can be obtained at a reasonable price, *i.e.*, milk fever outfits.

To carry out the treatment properly, the following precautions must be taken, viz.—The udder and teats must be washed with warm water and soap, afterwards with some antiseptic solution such as lysol, washing soda,&c., and place a clean towel underneath. The teats should not touch the ground, where they might become soiled. Then, after boiling the teat syphon (found in outfit), insert into teat and pump until the quarter is inflated, and then tie the teat with piece of tape and repeat to other quarters. Air can be left in for two hours, and if animal is still down repeat process. Before pumping, however, milk out the udder to get rid of any milk.

The cow must be kept in an upright sitting position, so that she is resting on breastbone, and this can be maintained by placing bags of sand against her shoulders. In half an hour the animal is generally on her feet. If paunch is very much inflated, as may occur if the cow is allowed to lie on her side, puncturing may have to be resorted to.

In the case of bladder paralysis it is often necessary to introduce hand into the rectum, and by gently squeezing the bladder the contents are evacuated. After the animal is up for a few hours it is advisable to give 1lb. Epsom salts and 1oz. ginger in two pints warm water and treacle.

Preventive Measures.—Where animals are on green feed a week before calving take them off and put on to dry fodder, and in case of gross-conditioned animals a very spare diet is desirable. The administration of a purgative three or four days before calving is expected is advisable, such as Epsom salts, ginger, &c., in two pints water. A free access to salt and water is important. Where calving has occurred suddenly, administer a purgative.

CONGESTION OF UDDER.

This condition is often seen in heavy milkers just prior to calving and afterwards, the udder being enlarged, hot, and tender, and there may be some slight swelling for a little way along the belly. This condition is a natural phenomenon, and usually disappears in two or three days after secretion of milk has been fully established. Its disappearance can be hastened by massaging the udder with the hands, applying at the same time a little camphorated ointment two or three times a day. Sometimes the milk is left in udder for a whole day, as seen when animals are being exhibited at shows with the idea of making a great show of udder for sale purposes. The result is that the udder is inflamed, the bag pits on pressure, and the milk is often streaked with blood, and is partially clotted and drawn from the teat with difficulty.

This condition should be treated with hot fomentations, massage, and rubbing in of ointment as advised for congestion.

(*To be continued.*)

PEACH LEAF CURL FUNGUS.

(*Exoascus deformans*) Fuckl.

FURTHER TESTS WITH COPPER COMPOUNDS.

By GEO. QUINN, Horticultural Instructor.

In this *Journal* for August, 1911, a detailed account of the results of a series of spraying tests made with copper compounds against this fungus at the Government Experiment Orchard, Blackwood, during the season 1910, was printed.

In the following spring (1911) it was proposed to repeat the trials—and in fact the same sprayings were actually applied—but the season opened so unexpectedly early that the leaf buds had shot before the applications were made, with the result which was anticipated—the fungus had secured itself too deeply to be controlled by any of the reagents used, and the leaves in all sections were badly diseased, though those upon the trees treated with pure solution of copper sulphate were less so.

In the season 1912 the trials were again proceeded with, and a fifth compound added in the shape of a Bordeaux mixture based on the formula advanced by Mr. Spencer Pickering, of the Woburn Experiment Orchards in England, in which the milk of lime was replaced by clear limewater. A Bordeaux powder was also substituted for the Bordeaux paste.

The spraying compounds used were—

(1) Bordeaux mixture.
(2) Burgundy or copper soda mixture.
(3) Woburn Bordeaux mixture.
(4) Copper sulphate solution.
(5) Bordeaux powder (Bickford's).

The trees treated consist, with one or two exceptions, of the alternate rows of a block of Elberta peaches, planted in 1908 on an even and gentle slope, for use in a permanent manure trial. These are the barrier or unmanured rows between those being dressed with various fertilisers year by year. They are all well-grown specimens, about 8ft. high by 6ft. to 8ft. through the spread of branches.

The three rows treated with copper sulphate solution were sprayed once only, viz., on August 20th. Of those rows to which the other reagents were applied, viz., six, seven, eight, and ten, each received one spraying only. The rows dressed with ordinary Bordeaux mixture being sprayed on August 6th, whilst those receiving the Burgundy mixture, Bordeaux powder, and Woburn Bordeaux were treated on August 12th—six days later. The other rows, which received two sprayings, were treated on August 12th and 26th, excepting those on which ordinary Bordeaux was used, their first dressing being applied on August 6th.

The lesson of this season's trials—from the figures tabulated below—would appear to be the inadequacy of one spraying, whether given on August 6th as with ordinary Bordeaux, on 12th as with Burgundy, Woburn, or Bordeaux powder, or on 20th, when copper sulphate was used.

The average number of curled leaves per tree on those sprayed once with ordinary Bordeaux mixture was 75·66, against an average of three when sprayed twice. On the Burgundy-treated trees they averaged 11·33, against ·66 when treated a second time. The single dressing of Woburn Bordeaux yielded an average of 303·66 per tree, against 3·33 when twice sprayed. On those receiving Bordeaux powder once 4·66 diseased leaves were gathered per tree; those treated a second time showed an average of six diseased leaves per tree—a result which, it must be admitted, is somewhat perplexing.

At the times of the first sprayings the buds outwardly appeared to be almost quite dormant, but on August 20th there was evidence of movement in them, and by the 26th they (the flower buds) were clearly beginning to unfold.

TABLE OF RESULTS.

Row.	Tree.	Spraying Compound	Dates of Spraying.	Diseased Leaves on Nov. 5th.	Diseased Leaves on Dec. 11th.	Total Diseased Leaves per Tree.	Total Diseased Leaves per Row
1	1	Bordeaux Mixture— (Copper sulphate, 1lb.; lime, ¾lb.; water. 10galls.)	Aug. 6 and 26	—	—	—	
	2			5	—	5	
	3			10	—	10	15
2	4	Burgundy Mixture— (Copper sulphate, 1lb.; sodium carbonate, 1lb. 14oz.; water, 10galls.)	Aug. 12 and 26	—	—	—	
	5			—	—	—	
	6			1	—	1	1
3	7	Woburn Bordeaux— (Lime, 5oz.; water, 10 gallons. Take 9galls. clear limewater and add 1gall. solution containing 10¼oz. copper sulphate)	Aug. 12 and 26	—	—	—	
	8			—	—	—	
	9			6	—	6	6
4	10	Copper Sulphate— (¼lb. dissolved in 10galls. of water)	Aug. 20	45	1	46	
	11			30	—	30	
	12			53	13	66	142
5	13	Bordeaux Powder— (Bickford & Sons)	Aug. 12 and 26	—	—	—	
	14			1	—	1	
	15			22	—	22	23
6	16	Bordeaux Mixture	Aug. 6	167	—	167	
	17			—	—	—	
	18			58	2	60	227
7	19	Burgundy Mixture	Aug. 12	—	—	—	
	20			28	—	28	
	21			6	—	6	34

TABLE OF RESULTS—*continued.*

Row.	Tree.	Spraying Compound.	Dates of Spraying.	Diseased Leaves on Nov. 5th.	Diseased Leaves on Dec. 11th	Total Diseased Leaves per Tree.	Total Diseased Leaves per Row.
8	22	Woburn Bordeaux	Aug.	325	—	325	
	23		12	201	—	201	
	24			364	21	385	911
9	25	Copper Sulphate (solution)	Aug.	16	—	16	
	26		20	37	5	42	
	27			138	5	143	201
10	28	Bordeaux Powder (Bickford's)	Aug.	—	—	—	
	29		12	7	—	7	
	30			7	—	7	14
11	31	Bordeaux Mixture	Aug.	—	—	—	
	32		6 and	1	—	1	
	33		26	2	—	2	3
12	34	Burgundy Mixture	Aug.	—	—	—	
	35		12 and	3	—	3	
	36		26	—	—	—	3
13	37	Woburn Bordeaux	Aug.	12	—	12	
	38		12 and	—	—	—	
	39		26	2	—	2	14
14	40	Copper Sulphate Solution	Aug.	237	25	262	
	41		20	511	34	545	
	42			144	3	147	954
15	43	Bordeaux Powder (Bickford's)	Aug.	1	—	1	
	44		12 and	11	—	11	
	45		26	1	—	1	13
16	46	Trees never sprayed—(Soil above each tree's roots dressed with ¼lb iron sulphate each winter since 1909)		1,968	93	2,061	
	47			1,593	72	1,665	
	48			2,090	91	2,181	5,907

SUMMARY OF ABOVE TOTALS OF DISEASED LEAVES COMPARED WITH RESULTS OBTAINED IN 1910.

	1912.	1910.
Six trees sprayed twice with Bordeaux Mixture Yielded	18	14
Three " once with " " "	227	10
Six " twice with Burgundy " "	4	—
Three " once with " " "	34	—
Six " twice with Bordeaux Powder "	36	—
Three " once with " " "	14	—
Six " twice with Bordeaux Paste "	—	—
Three " once with " " "	—	158
Six " twice with Woburn Bordeaux "	20	—
Three " once with " " "	911	—
Nine " once with Copper Sulphate Solution	1,297	17
Three trees unsprayed (soil dressed with iron sulphate)	5,907	325

It would appear from the above comparison that the work of 1912 was less effective in suppressing the curl leaf fungus than the sprayings of 1910. As far as could be ascertained from observations made amongst peach plantations generally in the State, both seasons were productive of much curl leaf disease; but, assuming that in this respect the honors were fairly even, another factor of importance must be mentioned. This is, the trees, with few exceptions were those operated upon in 1910, when they were only three seasons old and bearing approximately only one-half the foliage they did in 1912. This increase in size would enlarge the mechanical difficulty of dressing all parts of the trees so thoroughly as would be possible in the case when they were of lesser statue. On the other hand, in so far as the remedies were concerned, effectiveness should not be lessened if the dressing be equally complete. The weather conditions usually accepted as favorable to the development of this fungus are a showery spring intermixed with sudden fluctuations of temperature. In the table below the rainfall occurring at Blackwood during the progress of the test in 1910 is given in weekly periods, but as these do not run on all fours with the weekly periods compiled for me for 1912 they cannot be closely compared.

In 1912, however, the tests began on August 6th, and were completed with the last collection of diseased leaves on December 11th, equalling a period of 19 weeks. In 1910 the trials began on August 15th and ended on November 22nd, with the gathering of all diseased leaves, or 14 weeks. A glance at the totals show that if the period covered by the date of the 1910 trial be taken in the 1912 rainfall records, the precipitation is 10·83in. in 1912 and 8·78in. in 1910.

Table showing the Average Weekly Rainfall and Average Temperatures, Minimum and Maximum, in the Soil at a depth of 2ft. 3in., and in the Shade, during the period the Peach Leaf Curl Spraying Tests were in progress in 1912.

		Temperatures.			
Weekly Periods.	Rainfall.	Soil, 2ft. 3in. depth.		Shade.	
	In.	Min.	Max.	Min.	Max.
Aug. 5–11 Aug	·69	44	57	54	57
" 12–18 "	·15	39	60	52	58
" 19–25 "	·79	42	65	55	59
" 26–1 Sept.	·53	40	57	54	58
Sept. 2–8 "	1·88	42	61	55	59
" 9–15 "	1·03	45	60	57	60
" 16–22 "	1·27	37	61	54	57
" 23–29 "	·35	49	68	58	60
" 30–6 Oct.	·64	39	64	58	62
Oct. 7–13 "	·54	46	67	59	61
" 14–20 "	·05	44	67	61	65
" 21–27 "	Nil	46	75	67	72
" 28–3 Nov.	1·14	49	64	68	72
Nov. 4–10 "	·27	49	65	63	68
" 11–17 "	·55	49	69	66	70
" 18–24 "	1·64	48	69	64	68
" 25–1 Dec.	·24	52	76	67	74
Dec. 2–8 "	1·71	52	75	71	74
" 9–11 "	·39	48	63	64	66
	13·86	Total rainfall from August 5th to December 11th, 1912.			

1910. Weekly Periods.	Rainfall. In.	
Aug. 14–20 Aug.	·44	
" 21–27 "	·90	
" 28–3 Sept.	·41	
Sept. 4–10 "	2·03	
" 11–17 "	1·22	
" 18–24 "	·30	
" 25–1 Oct.	·18	
Oct. 2–8 "	·53	
Oct. 9–15 Oct.	·64	
" 16–22 "	·70	
" 23–29 "	·41	
" 30–5 Nov.	·89	
Nov. 6–12 Nov.	·13	
	8·78	Total rainfall from Aug. 14th to Nov. 12th, 1910

In consulting these tables very considerable fluctuations will be noted in the temperatures, more particularly in the soil readings. As far as the writer is aware this is a phase of the subject of the study of the prevalence of curl leaf fungus as yet uninvestigated, and the records herein quoted may prove more enlightening as time goes on. Summing up the results of the two seasons' trials, and this in the light of the varying climatic conditions which prevailed, there is strong evidence that the Burgundy or copper soda compound is a splendid fungicide, in so far as its powers to repress the curl leaf of the peach is concerned.

When applied twice the ordinary Bordeaux mixture made with milk of lime is very efficient. The same possibly may be claimed for the Woburn Bordeaux; but only one season's trial is not sufficiently convincing. The Bordeaux powder bears out the promise of the paste, but further tests are desirable, as the results of one and two sprayings are somewhat contradictory.

The disappointing factor in the 1912 trial is the failure of the copper sulphate solution, which promised so well in 1910, and stood out conspicuously in the unrecorded sprayings of 1911.

The enormous increase in the number of diseased leaves on the trees which have never been sprayed shows very clearly that four years' dressings of the soil above the roots with ferrous sulphate has afforded no protection against the ravages of this leaf destroyer.

It may be mentioned that these unsprayed Elberta trees are a year younger than those in the rest of the plot, and markedly show the stunting effect of the repeated attacks of this disease. In conclusion, I desire to place on record my indebtedness to the orchardist at the Blackwood Experiment Orchard (Mr. Savage) and his assistants for the care taken in carrying out these trials.

FORESTRY IN AUSTRALIA.

By H. Hugh Corbin, B.Sc. (Lond.), B.Sc. (Edin.), Instructor in Forestry, Department of Woods and Forests, South Australia.

[Under the above heading comprehensive and useful information relating to forestry, compiled by Mr. H. Hugh Corbin, B.Sc., has been issued in pamphlet form by the Woods and Forests Department. The publication bears evidence of considerable research by the author and contains a mass of statistics which should prove exceedingly valuable for the purpose of record and comparison. Mr. Corbin states that the object of the pamphlet is to prove the value of our forests, and below will be found extracts which are most likely to concern the ordinary reader.]

BRIEF SURVEY OF THE AIMS OF ECONOMIC FORESTRY.

Economic forestry, aiming at the conservation of forestal wealth by safeguarding forests against inconsiderate destruction, and by the suitable reforestation of denuded areas, is essential to the preservation of industries dependant upon an adequate supply of timber, and to the perpetuation of a necessary form of national wealth. Though in Australia large areas of virgin forests still remain, the inroads made by timber-getters, by agriculturists, and by pastoralists—who have destroyed large areas by "ringbarking"—are considerable; and it is not unlikely that climatological changes are caused thereby. For it would appear that variations in climate, and alternating periods of drought and flood, desiccation and erosion of soil, with loss or diminution of fertility, have resulted from forest denudation in countries bordering the Mediterranean. In many of the States of America diminished rainfall is said to have followed the destruction of large forest areas. On the other hand beneficial consequences appear also to have followed on the planting of trees on denuded lands, or along encroaching coasts, and it is obvious that a forest covering tends to beneficially regulate the effects of rainfall.—(*Taken from the Commonwealth Year Book.*)

The above, which puts the case very briefly and well, reveals the state of affairs in Australia.

Timber of the World.—In the rest of the world the land surface has a certain large proportion of forest which has from time immemorial been developing giant forest trees—many of these individuals have taken centuries to grow. Amongst them are also many smaller and younger trees and seedlings. This is the condition prevailing in the virgin or primeval forests.

Reduction of Forests by agency of Man and Fire.—Owing to the vast increase of the population of the world and the spreading of the white races over the later discovered continents, and their extraordinary capacity for using wood, these primeval forests have been enormously reduced in extent, and the old, bulky timber has been wastefully cut down and shipped to the large industrial centres and there put to innumerable uses.

Fire has been the next most destructive agent, and in America, Russia, Siberia, and India, and many other places, thousands of square miles of standing forest timber have been destroyed.

Scarcity of Timber being Felt.—The result at the present time is that large and sound timber on the market has become almost a thing of the past. That which is available can only be obtained at very big prices, owing to its being scarcer and the fact that the lumberman has to go further afield. The price of timber is likely to steadily rise for many years, especially for good quality lumber, and there can be little doubt that the present steps to conserve and afforest are inadequate. The vast inroads of civilisation into the " wood capital " of the forests have made it necessary for the lumberman to utilize inferior and immature timber in order to meet the demand for certain classes of wood. The situation is becoming such that timber-exporting countries are raising their export duties on forest produce ; the destruction of their forests is endangering their national prosperity, and they are realising this. They are vigorously conserving and repairing their forests, also in many cases afforesting new areas in the hope of being able to produce enough timber for their own consumption in the future, and at the same time prevent erosion and conserve moisture, maintain moderate climatic conditions, and generally foster the resources of the land. The utility of forest areas on a reasonable scale is proved beyond doubt. For information on this subject it is only necessary to read modern literature.

Wood Capital.—From the point of view of timber only, the difficulty is that trees grow but slowly and cannot be profitably cut until they have reached a certain stage of maturity.

The felling of these trees which are already mature continues at such a rate that in a comparatively few years mere saplings will be the only timber available. In other words the wood capital of the world is being consumed rapidly.

As an example of the above the United States Forestry Department publish statements to the effect that some of the Californian Redwoods Sequois are of great antiquity. One tree is known (by counting the annual rings) to have attained at least 4,000 years ; these giants are nearly all gone.

Australian Growth.—Here in Australia, however, we have a distinct advantage over many other climates in that wood grows much more rapidly, and, therefore, the production of volume of wood is not such a waiting game ; but who can say how old many of our larger forest trees are, and can we wait until our younger trees attain maturity ?

Substitutes for Wood.—It has been urged that metals will take the place of timber, but in the United Kingdom, where metal, &c., is enormously substituted for wood, the importations of wood are very heavy, *e.g.*—Value of imported timber—1907, £27,093,054 : 1908, £24,306,169 ; 1909 £23,591,579. 1910, £26,207,329 ; 1911, £25, 62 171.

Probably only a trace of this is exported again, except after being converted into articles of use.

Wood More and More Indispensable.—It is beyond all doubt that wood is indispensable, and as the population of the world increases more and more will be required ; hence there seems to be little risk of the over production of wood.

Exhaustion of several Important Varieties of Timber and Degeneration of Quality.—Already several species of timber are practically exhausted—European oak, ash, beech, walnut—small and inferior Oregon pine are shipped now instead of the superior quality and more or less knot-free pines and Baltic deals, and knotty, small trees only are available. New Zealand kauri will only last about 15 years at its present rate of consumption, jarrah and Californian redwood are heavily exported, and will become scarcer and more costly, and eventually disappear as an article of commerce.

The general deterioration of forests and hence the increasing difficulty of getting good timber at reasonable prices is common knowledge to those interested in timber. It is difficult to predict the state of affairs which is likely to obtain, say, in 20 years' time ; but there seems every indication that good timber land will get more and more valuable and that most countries will be forced to invent wise policies with regard to timber production, and will undoubtedly be conserving and planting on areas which are capable of yielding high returns of timber, on some of their best land for production of the timber of the future. With modern scientific methods forests offer a very sound investment.

What is required now in Australia is public sympathy and support, and practical scientific forestry. It would be a pity to leave the consideration of these matters until much expenditure is necessary to put things right. At the present time much of the country called " forest " has very few trees to the acre. Proper forests can hardly be said, speaking quite generally, to contain less than 100 trees to the acre, and these should be large timber trees—60ft. to 100ft. high or more. When trees are less dense the country merges into park country, and, as they get fewer, into open timbered country.

The forests of the future will consist of trees which will afforest more or less densely, and they will not be very old when claimed by the axeman.

Australia Grows Some of the Finest Hardwoods in the World.—In Australia there are many extensive valuable forests which must be looked to to ultimately provide timber in the place of imports. Australia has the advantage of a variety of climates, and should be able to provide timbers which, though not identical with those imported, should be quite as satisfactory.

South Australia, although not so densely wooded as some of the other States, is yet quite capable of producing timbers in sufficient quantities and of such nature as would replace the greater part of the enormous importations.

There are many localities in this State where the soil and climatic conditions are such that a great variety of species is possible. This is rendered obvious by the fact of the presence of fine specimens of trees here and there about the country. The argument that some of the choicer species do not grow as quickly as some of the other species is poor, because quick-grown timber is necessarily lighter and inferior. Moreover, a variety of species is essential, since it is certain that one species cannot serve all purposes. The great point is for Australia, and especially South Australia, to make the most of these choicer localities where valuable timbers can be produced.

Responsibility of Forest Officers.—It is essential also to have men in charge of timber-producing areas who know forestry from all points of view, because incompetence on the part of the officer in charge may mean that the timber produced is inferior or useless owing to its not having received the correct treatment while growing. In fact, this responsibility is usually made to rest upon several officials.

Carelessness, ignorance, lack of watchfulness, or incompetence of any kind is bound to revert on the revenue-yielding capacity of the forest, *e.g.*, failure to observe an outbreak of fire in a dry time of the year means probably the destruction of thousands of pounds worth of valuable timber. The same remarks apply, though to a less extent, to outbreaks of insect or fungoid attacks. Fire is usually guarded against by organising firebreaks and a system of forest telephones to enable the outbreak to be checked in its infancy.

These precautions, however, vary with the value of the timber. A valuable forest should be well staffed, and the rest follows. The responsibility of a forester is always greater than that of the manager of agricultural land, because the forest represents the accumulated interest of many years, *e.g.*, an acre of forest may contain easily 500 trees which have been growing 40 years, and are worth 10s. each on an average at the lowest estimate, or total value equal £250 (some areas of timber are worth much larger sums); whereas an agricultural crop represents only one year's interest on capital, and may be only worth per acre, say, £20-£30 at the most when fully mature. Therefore foresters must be thoroughly reliable and skilled in their work.

Foresters should also be charged with the responsibility of daily meteorological observations, which are of such importance not only to themselves but generally outside the forest ranges.

Wheat and Forest Land.—It has been said that wheat produces a higher revenue than timber. No doubt this is true of certain soils and certain localities, but the reverse is also true about other soils and localities. This matter is merely a question of the judicial selection of a site suitable for the crop.

A treeless country must of necessity import timber for its own use, often at high cost; therefore, for this and other reasons, a certain amount of timber area is essential in each and every country if it is desired to obtain the fullest benefit of the soil at the lowest cost. Forests are being fostered even in Egypt.

One thing that seems very advisable is to concentrate the available resources on well-chosen and extensive areas where timber will best develop, and thus reduce the cost of administration and increase its efficiency. Many small reserves are bound to be expensive.

Forestry and Labor.—Another matter of great importance is labor. Labor is a *sine qua non* even in forestry, and there is no doubt that with regard to wattle-stripping it has lately been uncertain in South Australia. However, the question of labor applies to every industry. Prosperity and development cannot exist in the absence of satisfactory labor. It is clear, also, that it is as much in the interest of the laborer to help to develop the essentials of life, *e.g.*, wood, tanning bark, wherewith the leather for his boots may be made, &c., as it is in the interest of any other unit of the community. One of the great advantages forestry offers to the laborer is that it provides a very congenial, interesting, profitable, and healthy way of earning a living, and supplies with raw material many subsidiary industries in which his fellows may seek employment. Forestry may be managed so as to provide continuous and steady employment throughout the whole year.

Forestry assists in the development of the land and tends to relieve the congestion of population in the towns, and is one of the most important matters of the present day, especially in a new country such as Australia.

Forestry and Shelter.—This account is intended to deal more with the financial side of the subject and less with the other aspects, such as the advantage of shelter belts in protecting young and delicate crops from the tempestuous and scorching winds, and the fact that timbered country conserves to some great extent the rainfall and prevents erosion of the land surface.

However, it is worth noticing that high authorities in the matter of crops are of opinion that many of the sandy patches and stock roads of the country could, with advantage, be planted with trees for the purpose of shelter belts and timber. It would be a means of utilising these areas, which are at present considerable in extent and unproductive. It is well known that trees in shelter belts protect the land from fierce, hot winds in summer and cold blasts in winter. This matter wants to be systematically taken in hand.

In a country where there are many hot, dry months, and the rainfall is very unevenly distributed throughout the year, the need of conservation of moisture is great. Shelter belts and timbered areas should therefore be fostered with more care than in more humid climates.

It is impossible to estimate the benefits derived directly and indirectly from timbered country, but it is now generally recognised that forestry is essential to the well-being of each and every country.

Relative Areas of Forest Lands, Australia and Other Countries.

Country.	1906.		1910.	
	Total Forest Area.	Percentage of Total Area.	Total Forest Area.	Percentage of Total Area.
	Sq. Miles.	Per Cent.	Sq. Miles.	Per Cent.
Australian Commonwealth ..	167,245	5·62	159,375	5·35
New Zealand	32,150	30·69	26,678	25·65
United Kingdom	4,325	3·56	4,800	3·96
France.....................	32,421	15·66	36,005	17·58
Algeria	10,872	3·17	10,249	2·98
Germany	21,868	10·47	54,015	25·90
Switzerland	3,296	20·63	3,290	20·60
Italy	15,803	14·29	15,796	14·29
Austria	37,759	32·58	37,700	31·66
Hungary	34,700	27·66	16,475	17·90
Roumania	10,640	20·98	4,312	8·50
Sweden	25,648	14·84	90,241	52·20
Norway	26,330	21·21	26,685	21·50
Russia in Europe	860,781	40·55	859,375	43·04
United States	1,000,000	33·67	860,000	24·08
Canada	1,248,800	33·34	836,000	22·33
Cape Good Hope.............	537	0·19	537	0·19
British India	107,125	9·85	128,890	11·74
Japan	27,298	18·49	28,450	19·00
Average	..	18·8	..	19·37

In this table the following points are worth notice: —

1. These figures are necessarily only approximate, but nevertheless valuable.

2. The tendency of all the progressive nations is to increase their area of forests.

3. The United Kingdom, Algeria, Roumania, and the Cape of Good Hope have all very low percentages of forest land. Australia has also a very low percentage, but it has also large deserts. An endeavor should, however, be made to possess an adequate permanent area of good timber country. It is unnecessary to state an exact per centage, but from the above table the average of all countries cited is about 20 per cent. Therefore, in Australia there is probably room to develop out better forest areas and make them bear a reasonable proportion in point of dimensions to the habitable area of Australia.

4. Where there have been extensive primeval forests the inroads of civilization have been very heavy (*e.g.*, Canada alone having between 1906 and 1910 reduced its forest area by 412,800 square miles ; America has also lost 140,000 square miles of forest in the same time). This reduction is due to settlers and agents clearing forest lands to make room for homes and farms. There is no doubt great necessity for clearing and the conversion of some of the timber into other necessities, especially in a new country, where probably at first the only source of wealth is timber. Cf. Tasmania, pp. 5 and 6 How long will its timber last ?

Theodore Roosevelt, however, said, in 1905, in an address to the American Forestry Congress, " You all know the individual whose idea of developing the country is to cut every stick of timber off it and then leave a barren desert for the homemaker. That man is a curse, not a blessing, to the country." But it is also a fact that millions of acres of valuable timber in Canada and the States have been devastated by careless, selfish individuals ; fires have also been started in country heavily timbered and which is quite unsuitable for agriculture.

SUMMARY.

The total value of timber, as declared at the Customs, imported into the Commonwealth during the period 1901-1910 = £14·55 millions.

The total value of timber, as declared at the Customs, exported from Australia during the period 1901-1910 = £6·849 millions.

Therefore considerably over £21·39 millions worth of timber is cut or used in the Commonwealth, excluding that which does not pass the Customs and is locally sawn.

	Millions.
Value of timber imported into the Commonwealth—1901 =	£2·085
Value of timber imported into the Commonwealth—1910 =	£3·547
Value of timber exported from Commonwealth—1901.... =	£0·666
Value of timber exported from Commonwealth—1910.... =	£1·020

If the timber locally sawn be considered in addition to the above, it is evident that the total value of wood utilized in the Commonwealth is very high.

The value and quantity of timber imported into the Commonwealth are increasing yearly.

The value and quantity of timber exported from the Commonwealth yearly are not increasing in a similar way.

South Australia alone has imported during period 1905-11 from over the sea £1·843 millions worth of timber, and during 1905-09 from other States in the Commonwealth, £542,248 worth.

The average annual importation of timber into South Australia is well over £370,000, and this is increasing steadily.

The world's timber-yielding forests are decreasing in number and extent, while the population of the world is increasing rapidly.

The world's rate of consumption of good, sound timber is probably many times its rate of production.

Wood is indispensable, and its consumption has increased in spite of the substitution of metals and other material.

Progressive countries are conserving and afforesting on scientific business lines, and not allowing a few mercenary individuals to dissipate by wasteful methods the national wealth represented in timber, the destruction of which causes deterioration of the land and crops.

Australia has over 150,000 square miles of "forest," of which in 1910 27 million acres were specially reserved for timber.

Selected portions of these should be put in order, and to do this skilled foresters are necessary.

Taking the Commonwealth figures it is seen that the revenue of the State forests is every year nearly double the expenditure. Figures for 1910-11—

Expenditure	£110,923
Revenue	£203,256

Much might be done to develop the subsidiary industries of the forests.

Several parts of Australia have different climates, and therefore it should be possible to produce sufficient varieties of timbers for all purposes, which should in time obviate the necessity of extensive importation.

RECOMMENDATIONS.

The main objects of forestry to be achieved in Australia are—

(1) To carefully develop in commercial quantities the indigenous timbers which are suitable for commercial purposes.

(2) To carefully establish and develop exotic timber trees which will grow in the various States, also in the choicer localities develop the choicer species in order to produce as much variety of timber as possible.

The above two lines of work are most important in view of the costly importations.

(3) To develop the utilisation of these timbers and the best methods of seasoning, and treating by impregnation the more pervious and inferior species to render them more durable.

(4) To draw attention to the possible by-products of the forests and the possible subsidiary industries.

(5) To improve the climatic conditions locally and conserve the rainfall as much as possible.

(6) To introduce a proper and comprehensive system of education in the matter of trees in order to stimulate public interest in the work of tree culture.

(To be continued.)

CONTROL OF ORCHARD PESTS.

At the last meeting of the Blackwood Branch of the Agricultural Bureau, the Hon. Secretary, Mr. C. G. Savage, contributed an interesting and instructive paper on the control of orchard pests.

Mr. Savage said—In dealing with this subject it is necessary to understand something of the disease which we wish to control. We can split our subject into two divisions, viz., (I.) *Insect Pests,* which we my divide into two subdivisions—(*a*) *Mandibulate,* or chewing insects ; and (*b*) *Haustellate,* or sucking insects. (II.) *Fungus Diseases.* In this division we have—(*a*) *Epiphytic*—fungi which grow on the surface of the leaves and young shoots and send their root-like portions into the plant cells ; and (*b*) *Endophytic*—fungi which live in the internal cells of the plant.

With these few points before us we can understand why all sprayings for insect pests, for example, are not the same. It is easy to realise that if we cover our tree with arsenate of lead in hopes of killing a sucking insect, we are wasting time and material, as the insect thrusts its sucking tube through the epidermis of the plant and feeds on in spite of the poison.

I propose to deal with each section separately.

I.—INSECT PESTS.

Chewing Insects.

The principle insects in this division with which we have to contend are codlin moth, curculio beetle, and cutworms.

The treatment for codlin moth is a familiar one to all. It consists of spraying the trees with some arsenical compound, preferably arsenate of lead. Having procured a reliable brand of the arsenate we must be very particular when and how we apply it, bearing in mind that the first spraying is the most important. This should be applied just after the petals have fallen and before the calyx cups of the young fruits have closed. Owing to the rapid growth of the fruit and the continuous hatching out of the caterpillars at this stage it is desirable to repeat the spraying in about seven to 10 days. The strength of the spray washes will differ slightly, according to the brand of arsenate used, but 3lbs. to 50galls. of water is about the average. It will be well with the first spraying to see that some of the poison lodges in the calyx cups, as many of the caterpillars enter at that end. There are two and often three broods of caterpillars during our season, and it is necessary to apply a third spraying, and often a fourth at three or four weeks intervals.

We can greatly assist in overcoming this pest by scraping off all dead and cracked bark from the trees, cleaning knot holes, and keeping the orchard free from rubbish, as these are the natural hiding places for the full-grown caterpillars. Traps may be set by tying bagging around the stems of the tree, under which they will seek shelter. These traps should be examined every week and the caterpillars killed. If these bands are not systematically examined they should be left off altogether, otherwise we are merely harboring the enemy.

The Curculio Beetle is not a common pest in this district, so far as I am aware, but I have seen the effects of it upon a few trees. As it does much damage in other parts of the State, a word or two in relation to its control will not be out of place. Spraying the trees with a solution of 1lb. of arsenate of lead to 8galls. of water will help in diminishing the pest. Do not spray until the mixture runs off, but merely coat the leaves with a mist-like spray. It is well to bear this point in mind in spraying for other chewing insects, the reason being that when the mixture runs off the plant it carries most of the poison with it and we get left only a small amount of arsenate coating the apex of the leaves. The mist-like spray covers the whole surface of the leaves and evaporates rapidly, leaving the poison distributed evenly over the foliage. Dusting the trees with Paris green and flour gives good results. These materials should be mixed in the proportion of one of green to 50 of flour, and applied while the foliage is damp.

For Cutworms, spray the trees with a strong solution of arsenate of lead, or lay poison baits. The bait may be made by mixing the following:—8ozs. Paris green, 4lbs. molasses or sugar, 30lbs. bran, with sufficient water to make a paste. Place small portions of the mixture around the stems of the trees, but not against them.

Sucking Insects.

In this section there are the scales, aphides, and the pest commonly called red spider (*Bryobia pratensis*) with which we have to contend.

Red Spider.—This pest (which is not a tree insect) has been working havoc among the gardens on the plains during the season that has just ended, and may be treated at this season of the year by spraying with red oil compounds and lime-sulphur washes. I will deal with the making of lime-sulphur sprays later, but would like to call attention here to one of the latest American bulletins relating to tests on the control of red spider. In the experiments under notice the lime-sulphur wash was used, and to this was added flour paste, the paste being made by pouring and stirring 4galls. of boiling water on to 4lbs. flour. This was then added to 100galls. of spray wash. The paste was used as a spreader of the spray, and could no doubt be used advantageously with other contact insecticides. This spray will not kill the eggs of the red spider, and a second application of the wash should be applied as the young emerge.

Scales.—The most effective way of dealing with these insects is by fumigation with hydrocyanic acid gas under air-tight covers. Spraying with various washes, of which resin wash has proved one of the best, greatly minimises the pest. Resin wash is made as follows:—Resin, 10lbs.; washing soda, 10lbs.; fish oil, 1½ pints (if procurable, if not use 5lbs. of soap); water, 50galls. Put the soda in sufficient water to allow it to boil freely; when dissolved gradually add the soap or oil, then slowly stir in the powdered resin, and boil rapidly for an hour, adding a little water from time to time to prevent the mixture boiling over; finally add sufficient water to make 50galls. We could also use lime-sulphur wash against this pest.

Aphides.—In this district we are mainly troubled with the black aphis of the peach, and we have remedies in resin and tobacco washes. This pest rapidly reproduces its kind; hence the necessity for several sprayings at intervals of seven to 10 days. Resin wash prepared as described and diluted to half the strength recommended for scales will prove effective. Tobacco wash may be prepared as follows:—Tobacco, 4ozs. to 8ozs.: pour over this ¾gall. of hot water and allow it to steep overnight, or if in greater haste simmer the tobacco over a slow fire for a couple of hours. Dissolve 2ozs. of soap in 1qt of water and strain the tobacco solution into this; a little resin wash may be added with advantage, or the addition of flour paste should prove effective. We should bear in mind that these insects are destroyed by suffocation, and this is done by bringing the spray washes in contact with their bodies and thus stopping up their breathing pores. The mixtures will give better results when sprayed on with force, and especially is this the case with the American woolly blight, which insects are covered with waxy filaments.

II.—FUNGUS DISEASES.

Epiphytic Section (External Fungi).

Mildews are the only diseases under this head that we need mention, and they are controlled by dusting flowers of sulphur over our plants. The sulphur is best applied in the early morning when the dew is on the plants, as it will not blow away so readily as it will when applied while the trees are dry.

Endophytic Section (Internal Fungi).

In this section we have the most troublesome of the fungus diseases, viz., peach curl leaf, shothole and scab of apricot, black spot or scab of the apple and pear, and gumming blight of peach, almond, apricot, &c. The remedies for all these diseases are found in the bluestone washes and lime-sulphur sprays.

Peach Curl Leaf.—The spraying must be done before the buds burst, just as they are swelling, and if the variety is very subject to the disease, or if the trees were badly affected during the previous season, spray when the buds are dormant and then follow up with a second spraying as they begin to swell. I would like to point out that it is a waste of time, so far as curl leaf is concerned, to spray after the leaves have expanded. The spores of the fungus lie lodged under the scales of the buds during the winter and when the sap begins to move in the tree and the buds to swell, the spores germinate and enter the young growth. If our spray mixture is upon the tree the young fungus growth comes in contact with it and is destroyed; if the spray is absent the fungus enters the plant and plays havoc, although we may spray our trees afterwards. For two years we have carried out spraying tests for the prevention of this disease with the following results :—

Spray.	No. of Sprayings.	No. of Trees.	1910. No. of Curl Leaves.	1912. No. of Curl Leaves.
Bordeaux Mixture	2	6	14	18
“ “	1	3	10	227
Woburn Bordeaux Mixture	2	6	not used	20
“ “ “	1	3	—	911
Burgundy Mixture	2	6	—	4
“ “	1	3	—	34
Bickford's Bordeaux Paste	2	6	—	not used
“ “ “	1	3	158	—
“ “ Powder	2	6	not used	36
“ “ “	1	3	—	14
Copper Sulphate	1	9	17	1297
Sulphate of Iron	—	3	325	5907

The trees in the last test were not sprayed, but ¼lb. sulphate of iron was forked into the soil around each. The variety of peach in all the tests was Elberta.

For Shothole and Scab of the Apricot, spray when the flowers are opening and again when the fruits are half grown. For black spot or scale of apple and pear, spray when the blossoms are opening, and repeat the spraying after the flowers have formed. The copper solutions may be mixed with the arsenate of lead sprays, thus saving the double amount of work.

For Gumming Blight, spray with the copper solutions as soon as the leaves have fallen in the autumn and burn all prunings from the affected trees.

FORMULÆ FOR SPRAY WASHES.

Bordeaux Mixture.—Four pounds bluestone, 3lbs. of fresh lumpy lime, and 40galls. of water. Dissolve the bluestone in 20galls. of water by suspending it just under the surface. This point is important, because if the copper sulphate is placed in the bottom ot the vessel it will take days to dissolve, but if hung near the top of the liquid it will dissolve in a few hours. When ready to spray slack the lime by slowly adding a little water, and when the lumps have crumbled to powder make up to 20galls. Run the bluestone solution and limewater gradually together in a third vessel and stir the mixture.

Burgundy Mixture.—Four pounds bluestone, 7½lbs. washing soda, and 40galls. of water. Dissolve the bluestone as before in 20galls. of water, dissolve the soda in another 20galls., and mix the solution by running them slowly into a third vessel. It is well to remember that in dissolving copper salts metal vessels should not be used, but wooden ones, as the action of the copper on the metal will soon destroy the vessel.

Lime-Sulphur Spray.—This wash is coming greatly to the fore of late years, and although not a common spray here is being used largely in some of the other States. The winter sprays may be made as follows:—Lime slacked under water three weeks before using, 6lbs.; sulphur, 12lbs.; soft water, 100galls.

A bag at a time may be slacked as above; and provided that the lime is always covered by the water, it is ready for use at any time required. Take 12lbs. of sulphur, mix it into a paste with 2½galls. of boiling water, add to it the 6lbs. of the lime paste and an additional 2½galls. of hot water, mix and divide the solution equally into two 5-gall. cans; boil from one to one and a half hours, keeping well stirred, and from time to time adding a little cold water to prevent loss in boiling over. Then make the whole up to 100galls., and strain before using. There is no fear of the mixture clogging the nozzles, and if the lime has been slacked as directed, no scalding to the operator takes place; at the same time it is advisable to keep the hands oiled. Keep the mixture well agitated whilst spraying. It may be applied cold. Many formulæ are used, and this one has given very satisfactory results. Be careful to use an iron vessel, as it will destroy vessels made of copper. On account of the lime-sulphur spray being quite caustic, it will soon make one's hands sore; it is therefore important to see when spraying is carried out that all connections on the pump and hoses are tight. Leather gloves should be used and the hands kept well greased. The horses and harness, when using large outfits, should be protected by a light cover. When left standing overnight, re-treating is necessary owing to the formation of sulphur crystals. When the mixture is well made it becomes a dark-reddish yellow, and should take from 45 to 65 minutes to prepare. There should be very little sediment.

A self-boiled lime-sulphur wash—lime (fresh lumpy), 16lbs.; sulphur, 16lbs.; water, 100galls. This mixture is suitable for spraying peaches or cherries, but is not so desirable for spraying apples. To prepare, put the lime into a barrel, add sufficient water to nearly cover it and to start the slacking. As soon as the slacking has well begun, add the sulphur, which has been rubbed through a sieve to break the lumps. Stir continuously, adding water as it is needed to prevent thickening, drying, or burning. As soon as the slacking ceases add the required amount of cold water, or enough to prevent further action of the heat. The boiling should not continue long enough to cause the formation of much brownish-yellow liquid at the top of the slacking barrel. For summer sprayings the mixtures should be diluted to about half strength. Stock solutions of concentrated mixtures may be made, stored, and diluted as required.

POULTRY NOTES.

By D. F. Laurie, Government Poultry Expert and Lecturer.

OPERATIONS FOR AUGUST.

Green Food for Summer Use.

The following green fodders may now be planted :—

Lucerne, the most valuable and productive of all fodders, will grow in most parts of the State. Thoroughly prepare the land, grade for irrigation, and sow mixed with bonedust. Seed, 6lbs. to 10lbs. per acre, bonedust, 100lbs. The seed should be lightly drilled in, so as to fall in the drills and not be buried. Cover with bush harrows. By drilling 7in. to 10in. in the rows the young plants can be cultivated and the ground kept clean. Keep the fowls away from the plot for the first year, otherwise they may injure the plants. Keep weeds down, and after each cut stir the surface. Later on—after each cut—give alternate dressings of bone super. and potash. South Australian Hunter River seed is excellent.

Silver Beet.—On well-prepared and manured land the seed may be drilled in rows 24in. to 30in. apart. The plants are afterwards thinned out to 15in. apart. For small plots sow a small seed bed and then transplant. Enrich the site of each plant with a little bonedust well-worked into the soil. The improved varieties of silver beet give splendid yields, and the plants last throughout the season.

Kails.—Jersey tree, Thousand-headed, and the French kail (Chou Moellier) are all well-adapted for the small or the large grower. Plants are obtainable from seedsmen, and should be planted out 30in. apart and 3ft. in the rows.

Other Fodders.—In some localities barley, oats, and rye may be sown, and will, if the season be propitious, yield a fine supply of palatable green food. Lettuce (cabbage) and the endives may be planted out in rows 18in. apart and 12in. between the plants. Endives are valuable for the high contents of minerals and salts. A bed of onions and another of garlic are well worth growing. Both should be fed to the breeding stock and the chickens. If fed to layers of eggs for human consumption they will impart an unpleasant flavor to the eggs.

FEEDING.

Breeders.—Give but little mash in the mornings, and for the heavy breeds let it be half bran, and use plenty of cut green food mixed in the mash. The bran should be scalded and then the pollard and green food should be incorporated, so that the resulting mass is well-mixed, semi-dry, and flaky.

Green Food, cut or suspended in bundles, may be feed two or three times a day. Use as much as the birds will eat.

Grain.—Good, hard, clean wheat, free from smut, should be fed in the scratching litter. Occasional feeds of peas, a little maize, and good stout potato oats may be given ; but all must be well scattered in the litter so that the birds must work hard for their living.

Grit.—Charcoal (¼in. cubes), sharp quartz, and shell grit should be placed in a hopper suspended where the birds can reach it, but yet cannot scratch the contents out of the hopper.

Water.—Use vessels which can be easily cleaned. Keep these clean—scrub them, scald them, and keep them in the shade away from filth. Fill twice daily with clean, fresh water. See that they are large enough and that enough vessels are in use for the flock.

General.—Do not overfeed. A few senseless people starve their birds, but the majority incline towards too liberal treatment. Give breeders a small feed of mash in the morning—the layers can have just as much as they will clean up in ten minutes. House scraps are excellent, but in many houses the supply exceeds the proper demands of the few birds kept, and in consequence the common troubles result from over-feeding. All soft food (mashes, etc.) must be fed in clean pans, and must not on any account be thrown on the ground nor in the scratching litter. Grain should not be fed in pans, but must be well scattered in scratching litter.

FEEDING CHICKENS.

Give chickens plenty of fine grit (sharp sand, fine charcoal grit, shell grit) ; of this they will consume a surprising amount, and without it they do not thrive. Finely-cut green food should be fed to them hourly—barley, barley grass, oats, rye, lettuce, kails, beet, &c. All growing ends and succulent growths are what they need and what they like. Years of experience show that hard feeding for the first few weeks gives the best results. There are several excellent chicken foods on the markets, but it is economical for the breeder of hundreds of chickens to buy a good grit mill and prepare his own feeds.

For the first week, wheat cracked into pinheads and screened on a fly gauze screen is the most satisfactory. After a week one may add hulled oats, skinless barley, a little maize—all cracked into coarse pin-head size—and a sprinkling of canary seed and millet, will afford variety. The fine meal may be saved, and after a few weeks may be mixed with bran and pollard, or, better still, with whole wheat meal, or a meal made of wheat, oats, barley, and a little pea meal. Scald enough bran to dry off a proper supply of the meal and feed it to the chickens in a semi-dry, flaky mass. As the chickens grow stronger the mash may be made firmer and fed on pedestals. The firmer mash or dough is better for fattening, and makes the chickens plump-up and grow quickly. Cracked grain mixture is fed at intervals in cocky chaff or other fine scratching material.

Earth worms are much relished by chickens. Bullock's liver, well-boiled, may be broken up and incorporated in the mash daily—only use a small quantity. Meat meal soup is also excellent and promotes growth.

DUCKLINGS.

Ducklings do well on scalded bran dried off with pollard and plenty of cut green food. Scald the bran with boiling milk or meat meal soup and allow it to swell; then mix in the pollard and green stuff. Give as much cut green food as they will eat. Provide grit in pans, as ducklings will eat large quantities. Grit may be mixed with the mash. Give no grain.

Ducklings must have *drinking water* available *day and night*. Keep it in vessels deep enough to permit the ducklings to totally immerse their heads. If ducks become thirsty at night and cannot obtain drink they will collapse in the morning after a drink.

TURKEYS.

The breeding season for turkeys is at hand, and the birds should be in good condition. Feed liberally on grain. Let the birds have as much liberty as possible. Give green food at all times. The chicks have small crops, and must be fed little and often. Feed as advised for chickens. Add to the mash finely cut onion tops or onion bulbs and garlic corms cut fine.

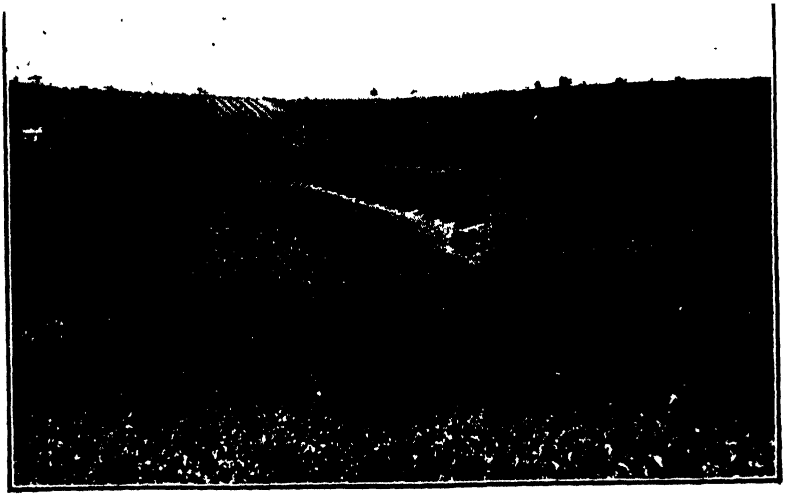
THINGS TO DO.

Keep your poultry yards and houses clean and well-drained. Fill up all hollows. See that the houses are dry and sweet. Protect the brids from draughts. Examine your stock and see that they are free from vermin. Use insect powders and provide dust baths. Study the article on "Poultry Parasites" in this issue. Examine your premises for poultry ticks, and eradicate them. If your neighbors breed ticks and other vermin, and have diseased poultry on their premises, promptly advise this department. Single test your pullets before breeding from them. If you do not understand the system send for a Bulletin on the subject. Do not breed from hens which lay small eggs. Do not use eggs for setting which are very small, very large, rough-shelled, or misshapen. Rough shells are due to inflammation of the oviduct. Misshapen eggs are caused by internal fat and sometimes by malformations. Wash the eggshells before marketing the eggs. If sending a distance use proper egg cases fitted with fillers. Collect the eggs daily and store in a cool, well-ventilated cellar. If you have no cellar, excavate one, using the excavated soil to cover the roof.

Market only infertile eggs. Test all eggs before forwarding them. Reject any egg which is not absolutely fresh. You ought to get more money for fresh infertile eggs. Sell direct to the retailer or the consumer.

Confine your operations to one breed. If you want eggs only, the White Leghorn of approved laying strain is what you require. If you want a fair supply of eggs and good table birds, select White Wyandottes, Rocks, White Orpingtons, R.I. Reds, Langshans.

Do not overcrowd your fowls nor neglect them, nor expect them to lay if deprived of proper food. Do not throw egg shells among the birds—this practice will encourage egg-eating. Do not expect to breed high-class layers from cheap rubbish. Do not plead ignorance when you can easily apply for advice. Do not claim the honor due to another breeder. Do not fail to read these notes each month. Do not be backward in writing for information ; it does not matter whether you have one hen or a thousand. Do not house your birds in those wretched eyesores termed poultry houses, and so common in the suburbs. Do not hustle your fowls ; treat them kindly and keep them tame and quiet. Do not fail to visit Parafield Poultry Station, and note the systems of housing, hatching, and brooding in vogue. Visiting days first Wednesday and fourth Saturday in each month.



Vineyards, Near Adelaide.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, to terminate March 31st, 1914.]

Competitor.	Eggs Laid for Month ended July 31st.	Total Eggs Laid from April 1st, 1913, to July 31st, 1913.
SECTION I.—LIGHT BREEDS.		
WHITE LEGHORNS.		
Hurford, E. W., Grangeville	121	373
Hammill, H., Kogarah, New South Wales	112	352
Carter, A. A., Keswick	84	195
Robins, G. W., Hawthorn, Victoria	120	375
Dunn, L. F., Keswick	121	327
McKenzie, H., Northcote, Victoria	144	426
Cowan Bros., Burwood, New South Wales	113	322
Robbins, G. W., Hawthorn, Victoria	116	315
Pettigrove, T. A., Northcote, Victoria	119	357
Eckermann, W. P., Eudunda	83	196
Robertson, F., New Hindmarsh	79	215
Pettigrove, T. A., Northcote, Victoria	139	387
Cant, E. V., Medindie	98	279
Schäfer, N. H., Strathalbyn	126	363
Redfern Poultry Farm, Caulfield, Victoria	107	328
Chapman, G. H., Port Pirie	61	192
Lewis, F. M., Caulfield, Victoria	84	265
Redfern Poultry Farm, Caulfield, Victoria	123	384
Hagel, W. C., Mallala	128	303
Hocking, E. D., Kadina	92	230
Sargenfri Poultry Yards, East Payneham	96	282
Joass, W. A., Rothbury, New South Wales	108	303
Bennett & Furze, Wright Street, Adelaide	102	290
Jury, W. H., Torrensville	124	334
Olive Poultry Farm, Freeling	92	298
Kelly, Mrs. W. J. L., Quorn	55	120
Indra Poultry Farm, Freeling	147	419
Electricum Poultry Yards, Glenelg	113	315
Sargenfri Poultry Yards, East Payneham	118	366
Moritz Bros., Kalangadoo	118	377
Brown, S., Gembrook South, Victoria	118	378
Matthews, H. G., Fullerton	140	326
Harris, J. G., Black Forest	118	354
Tockington Park Poultry Farm, Grange	146	339
Bradley, J. E., Newport, Victoria	137	425
Miller, B., Parkside	117	217
McKenzie, E., Northcote, Victoria	128	444
Tockington Park Poultry Farm, Grange	116	355
Provis, W., & Son, Tumby Bay	125	336
Hillcrest Poultry Farm, Brighton, Victoria	126	374

EGG-LAYING COMPETITION—*Continued.*

SECTION I.—LIGHT BREEDS—*Continued.*

WHITE LEGHORNS—*Continued.*

Competitor.	Eggs Laid for Month ended July 31st.	Total Eggs Laid from April 1st, 1913, to July 31st, 1913.
Beadnall Bros., Gawler	78	220
Morgan & Watson, Frankston, Victoria	126	421
Kerr, R., Longwood	129	303
Gibbs & Pine, Queenstown	71	176
Hillside Poultry Yards, Hamley Bridge	97	239
Hall, A. W., South Oakleigh, Victoria	81	275
Dreyer, G. H., Wolfram Street, Broken Hill	140	351
South Yan Yean Poultry Farm, Doreen, Victoria	124	280
Pope, R. W., Heidelberg, Victoria	127	391
Tabuteau, J. O., Black Rock, Melbourne	85	356
"Koonoowarra," Enfield	78	262
Hagger, J. C., Orroroo	136	328
Bertelsmeier, C. B., Clare	111	316
South Yan Yean Poultry Farm, Doreen, Victoria	120	302
Jelliff, Mrs. T., Beverley, Adelaide	138	357
Hughes, J. J., Elsternwick, Victoria	67	209
Stewart, J. R., Thirlmere, New South Wales	94	257
Aveling, T. B., Quorn	76	182
"Nunkerowi," Neales Flat	82	186
Prior, D., Moonta Mines	80	225
Leonard, W. J., Port Pirie	76	226
Barkla, L. W., Gawler South	92	244
Foreman, E., Hindmarsh	83	221
Broderick Bros., Gawler	79	178
Tubb, E. C., Frewville	93	195
Harfield, B. L., Pinnaroo	90	204
Foreman, E., Hindmarsh	112	214
Tomlinson, W., Westbourne Park	111	307
Woodhead, H., Torrensville	124	355
Padman, A. H., Hyde Park	94	292
Franklin, G., Norwood	150	351
Mathias & Weller, Unley	95	172
Messenger, A., Port Adelaide	124	301
Purvis, W., Glanville	116	294
Albion Poultry Farm, Magill	118	348
Dunstan, L. A., Port Pirie	91	225
Trenwith, T. H., Kadina	50	157
Purvis, W., Glanville	122	307
Rice, J. E., Cottonville	85	297
Evans, H. A., Richmond	96	225
Miels, C. & H., Littlehampton	117	333
Swift, W. G., Northcote, Victoria	124	337
Bertelsmeier, C. B., Clare	129	340
Brundrett, S., Moonee Ponds	102	221
Glenelg River Poultry Farm, Mount Gambier	128	287
Padman, A. H., Hyde Park	103	264
Purvis, Miss Gracie, Glanville	104	239
Braund, J. E. & H. J., Islington	104	252
Ontario Poultry Farm, Clarendon	67	180
Brock, A. G., Hamley Bridge	98	147
Russell, E. L., Salisbury	104	230
Schwabl, J., Elsternwick, Victoria	122	280
Moritz Bros, Kalangadoo	127	319

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended July 31st.	Total Eggs Laid from April 1st, 1913, to July 31st, 1913
SECTION I.—LIGHT BREEDS—*Continued.*		
WHITE LEGHORNS—*Continued.*		
Craig Bros., Hackney	106	228
Codling, H., Mitcham Park	50	200
Tidswell, H. J., Clarence Park	60	148
Bennett, E. V., Kalangadoo	93	275
Lillywhite, R. G., Malvern	84	210
Harris, A. W., Mallala	124	288
Hagger, W. H., Malvern	129	368
Winter, W. C., (Nalpa), Strathalbyn	84	174
Whitegate Poultry Farm, Deepdene, Victoria	110	214
BROWN LEGHORN.		
Toe, C. E., Brighton, Victoria	20	42
BLACK MINORCA.		
Whitrow, A. J., Knoxville	118	184
SECTION II.—HEAVY BREEDS.		
BLACK ORPINGTONS.		
Neville, A. B., Fullarton	120	244
Thornton, W. J., Kew, Victoria	104	222
Kenway, D., West Pennant Hills, New South Wales	149	387
Martin, B. P., Unley Park	139	284
Cowan Bros., Burwood, New South Wales	128	279
Tockington Park Poultry Farm, Grange	123	195
Pearson, W. S., Kingswood	112	195
Hall, A W., South Oakleigh, Victoria	113	214
Padman, J. E., Plympton	107	251
Greaves, W. E., Prospect	76	133
Bertelsmeier, C. B., Clare	68	124
Coto, T. W., Myrtle Bank, Victoria	133	286
Convent of the Good Shepherd, Oakleigh, Victoria	106	174
Craig Bros., Hackney	118	258
BUFF ORPINGTONS.		
Hocart, F. W., Clarence Park	97	206
SILVER WYANDOTTES.		
Dunn, L. F., Keswick	130	326
Western, F. C., Marion	97	195
Tockington Park Poultry Farm, Grange	133	299
Kappler Bros., Marion	91	188
WHITE WYANDOTTES.		
Bradley, J. E., Newport, Victoria	110	250
BLACK LANGSHANS.		
Stevens, E. F., Littlehampton	113	221
FAVEROLLES.		
Williams, W. H , Frewville	67	67
DORKINGS.		
Cathcart, J. F., Newburg, Scotland	37	88

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended July 31st.	Total Eggs Laid from April 1st, 1913, to July 31st, 1913.
SECTION III.—PRODUCERS.		
Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.		
WHITE LEGHORNS.		
Broster, G., Mallala	110	298
Carling, R., Kangaroo Flat	129	343
Rowe, J., Long Plain	99	293
Broster, G., Mallala	99	299
Gilbert, F. W., Kangaroo Flat	143	331
Campbell J. D., Barabba	126	300
Forest Leigh Poultry Farm, Jamestown	117	211
Kerr, R., Longwood	120	292
Carling, Mrs., R., Kangaroo Flat	118	337
Rowe, J., Long Plains	128	276
Gill, R., Marrabel	111	206
Wurst, G. H., Marrabel	127	216
Sherrah, E., Long Plain	107	212
Rowe, N., Long Plain	130	279
Shepherd, R. H., Balaklava	89	213
Lacey, F. C., Kybybolite	93	315
Bertelsmeier, O. O., Booborowie	128	310
Dunn, H. J., Black Springs	84	205
Drake, C., Naracoorte	113	233
Rackham, C. Naracoorte	132	341
Holmes, F. A., Naracoorte	79	246
Hutchison, W. J. S., Naracoorte	96	164
"Herdsfield," Mount Gambier	141	369
Smith, R. L., Hynam	98	176
Gill, Mrs. J., Kapunda	86	186
Sampson, C., Kooringa, Burra	95	308
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	81	102
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	81	264

D. F. LAURIE, Poultry Expert.

* * *

PARAFIELD EGG-LAYING COMPETITION.

MONTHLY REPORT.

HEALTH.

The birds are all looking exceptionally well, and there have been no cases of sickness.

DEATHS.

Five deaths occurred during the month, and all were due to cannibalism. Three cases occurred in one pen and two other cases in other pens, in one of which a case occurred last month. From observation it appears that certain strains are inclined to this trouble.

BROODINESS.

Two cases of broodiness occurred—one in section 1, White Leghorn, and the other in section 2, White Wyandotte.

WEATHER.

The month has been generally dry and windy; fine and cold in the mornings. Rain was recorded on six days, and the precipitation was about 1·1in. A rain gauge is being erected, and rain and temperature observations will be taken daily in future.

TINTED EGGS.

Tinted eggs among the White Leghorn pens are very numerous this season. Last year at Roseworthy there were very few. This season, however, a large number have been noted and are recorded. The brown tint in most cases is marked. Leghorns should lay eggs with pure white shells. The tinted shell is an undesirable character and should be eliminated. This is a point which breeders must make special note of.

EGG PRODUCTION.

The egg yield for the month is highly satisfactory. Various would-be authorities criticised the methods adopted, and offered opinions which they are not qualified to give. The predictions have failed. Scores did not fall off either in June or in July—both months showed a steady increase. Facts prove the wisdom and the value of the methods adopted. The birds are in the best health and the egg yield is gratifying. One pen, Mr. D. Kenway's Black Orpingtons, made a fine weekly score of 41. The "possible," 42, has never been recorded in a South Australian laying competition. The totals of eggs laid and the averages per pen of six pullets are as follows:—

Section 1....	104 pens ..	10,962 eggs ..	105·4 average per pen
" 2....	23 " ..	2,471 " ..	107·4 " "
" 3....	28 " ..	3,060 " ..	109·3 " "
Total	155 pens	16,493 eggs	106·4 average per pen

For 155 pens to average 106·3 eggs=17·7 per hen for the month is an excellent performance. The feeding is as usual. An excellent supply of green barley, oats, &c., enables all the stock to have an abundance of green food.

WEIGHT OF EGGS.

Regulation 12 states—"Any pens the eggs from which do not attain an average weight of 24ozs. per dozen by July 31st, 1913, will be ineligible to participate in the prize money and will be returned to the owners." On July 31st the eggs of each pen were set aside for the official weighing. The results, which are shown in the following table, are very satisfactory. There are only four pens which failed to produce eggs weighing 24ozs. to the dozen. This represents roughly 2·6 per cent. Thirty-nine pens just reached the required standard, and to the owners of these I would offer timely warning that they are in a dangerous position. Thirteen pens recorded quarter of an ounce above the standard, and the breeders of these are reminded that the margin of safety is too small. The public is becoming informed upon many points relating to poultry-breeding, and demand is for stock which will produce a standard size, or even larger eggs.

The following table shows the number of pens the eggs from which attained the weights given :—

Weight.	Number of Pens.	Weight.	Number of Pens.
27¾ozs.	1	25ozs.	13
27½ozs.	1	24¾ozs.	16
27ozs.	1	24½ozs.	15
26¾ozs.	2	24¼ozs.	13
26½ozs.	3	24ozs.	39
26¼ozs.	2	23ozs.	1
26ozs.	11	23¾ozs.	1
25¾ozs.	9	22½ozs.	1
25½ozs.	16	22¼ozs.	1
23¼ozs.	9	Total	155

DISQUALIFIED PENS.

In accordance with the regulations the following pens, which failed to produce eggs of the required weight per dozen, will be returned to their owners. They are—

Section 1—Pen 43 (White Leghorns), R. Kerr, Longwood; weight, 22¾ozs.

Section 1—Pen 75 (White Leghorns), W. Purvis, Glanville; weight, 22¼ozs.

Section 2—Pen 115A (Black Orpington), Craig Bros., Hackney; weight, 22½ozs.

Section 2—Pen 119 (Silver Wyandottes), Tockington Park Poultry Farm, Grange; weight 23ozs.

The total eggs laid by these pens will be deducted from the grand total, and the test will proceed and conclude without any regard to these pens, which will not form any part of the records of the test.

BALAKLAVA WHEAT COMPETITION.

SECOND SEASON'S RESULTS.

By G. H. STEVENS, Manager Turretfield Experimental Farm.

The importance of wheat selection and the value of competitions of the nature of the one now in progress at Balaklava have long been recognised, but the Balaklava Branch of the Agricultural Bureau, acting in conjunction with the Balaklava and Dalkey Agricultural Society, was the first to act and to carry into effect such a competition.

The second year of the Balaklava competition was completed at last harvest. The conditions governing this competition were published previously, but we repeat them here for the convenience of readers and as a guide to those Branches of the Agricultural Bureau who may contemplate similar action.

Briefly stated, the conditions are—

Competition is open to any resident of the district within a radius of 15 miles of Balaklava township. Any variety of wheat may be grown, provided that it is a good average milling variety. The seed for the past year's sowing may be procured by the competitor from wherever he pleases, and from the crop produced must be selected the seed for the second year's sowing, and from the second year's crop the seed for the third year. The competition will extent over a period of three years. The cup, valued at £10 10s., offered through the Bureau, will be awarded to the competitor who grows the greatest quantity of wheat of one variety from a quarter-acre of land during the three years. The Agricultural Society offers the sum of £5 in two prizes—£3 and £2—for the highest and second highest yield respectively from the quarter-acre each year.

ALLOTMENT OF POINTS.

1. Yield (80).—One point awarded for every 20lbs. of wheat per acre.
2. Milling qualities (10).—A. Percentage yield of flour (5)—Based on weight per bushel to a large extent, the range to be considered from a milling point of view being from 57lbs. per bushel to 66lbs., as follows :—

lbs.		lbs.		lbs.		lbs.	
57	0·5	59½	1·75	62	3·0	64½	4·25
57½	0·75	60	2·0	62½	3·25	65	4·5
58	1·0	60½	2·25	63	3·5	65½	4·75
58½	1·25	61	2·5	63½	3·75	66	5·0
59	1·5	61½	2·75	64	4·0		

B. Color (2)—Based on past experience with samples of flour from the various varieties of wheat milled in the department, viz.—

Fair 0·5	Good 1·0	Very good 1·5	Excellent 2·0

C. Strength (3)—Calculated on same lines as color, taking a range of from 40 to 50, viz.—

40	0·5	42	1·0	44	1·5	46	2·0	48	2·5	50	3·0
41	0·75	43	1·25	45	1·75	47	2·25	49	2·75		

3. Purity of seed and type.—Based on notes taken at time of inspection of growing crop.

4. Weight per bushel.—One point for every pound above 60lbs. per bushel. Wheats weighing less than 60lbs. per bushel receiving no points under this heading.

RESULTS.

Appended is a table of the second year's results of the competition—

Competitor.	Variety.	Yield per Acre. b. lbs.	Yield. Max. 80.	Milling Qualities. Max. 10.	Purity of Seed and Type. Max. 5	Weight per Bushel. Max. 5.	Total Points Scored.
1 Twartz, H. L. ...	Bunyip	26 20	79·0	9·25	4·5	4·5	97·25
2 Thomas, T.	Yandilla King ..	20 42	62·2	8·25	4·0	5·0	79·45
3 Wagner, F. W. ..	Marshall's No. 3 .	20 22	61·2	6·75	5·0	3·0	75·95
4 Goldney, R. S. ..	King's Red......	19 24	58·4	6·25	5·0	5·0	74·65
5 Roediger, P. H...	College Eclipse ..	19 20	58·0	7·0	5·0	4·0	74·0
6 Roediger, P. H...	Yandilla King ..	18 48	56·8	7·5	4·5	3·5	72·3
7 Roediger, P. H...	King's Red......	18 36	55·8	5·75	4·5	4·5	70·55
8 Roediger, P. H...	King's White ...	16 22	49·2	5·0	4·5	3·25	61·95
9 Goldney, R. S. ..	Federation	16 4	48·4	7·0	3·5	3·0	61·9
10 Wagner, F. W. ..	Bunyip	15 22	46·2	7·0	5·0	0·25	58·45
11 Thomas, T. A. ..	Federation	14 49	44·9	7·0	3·0	3·25	57·15
12 Neville, K.	Marshall's No. 3 .	13 24	40·4	7·0	5·0	3·75	56·15
13 Neville, K.	King's White ...	14 24	43·4	4·75	5·0	2·5	55·16
14 Goldney, R.	Genoa	12 28	37·8	8·0	5·0	4·5	55·3
15 Neville, K.	Gluyas..........	13 44	41·4	5·25	4·5	2·0	53·15
16 Neville, K.	King's Red......	13 0	39·0	5·5	4·5	4·0	53·0
17 Thomas, T. A. ..	Marshall's No. 3 .	14 20	43·0	5·25	3·0	0·25	51·5
18 Kelly, H. J.	King's White ...	13 0	39·0	4·75	4·5	2·5	50.25

Last year the first three positions were held by King's White (O. L. Rosenberg) first, with a total of 95·1 points; King's White (K. Neville) second, with 87·05 points, and King's Red (O. L. Rosenberg) third, with 85·1 points. This year, however, the best these varieties could do was to gain fourth position (King's Red) with 74·65 points.

It is gratifying to note the success of such an excellent milling wheat as Bunyip, which scored the splendid total of 97·25 points out of a possible 100. This variety last year occupied fourth position on the competition list. The seed used on that occasion was imported direct from New South Wales, and it seems that after being grown for one season it has become more acclimatised, with a corresponding larger yield from the second year's crop. A yield of 26·20bush. per acre in an unfavorable season, as was generally experienced in the Balaklava district last year, is certainly very creditable, and should the third year's results be equally favorable, it would seem that there is a great future ahead of this variety in that district. Yandilla King (second) yielded 20·44bush., and Marshall's No. 3 (third), 20·24bush. per acre.

Generally speaking the season was not a favorable one in the district; indeed it was one of the worst experienced there for many years, the rainfall being over 3in. below the average, and 2in. below the precipitation of 1911. As a consequence the yields from the plots were not as high as one would expect in a fair average season, but considered in view of the rainfall, they show systematic, thorough cultivation by the several competitors. The following is the rainfall for the year 1912:—

	In.		In.
January	Nil	July	1·54
February	·29	August	1·48
March	·75	September	1·91
April	·40	October	1·51
May	·13	November	1·71
June	1·60	December	1·02

Total 12.34in.

It was pleasing to note the enthusiasm and interest displayed in the competition, which was as keen, if not keener, than when operations were first commenced. There were four new entries, but these could not compete for the cup, because the selection extends over three years. They were eligible, however, to win the Agricultural Society's prizes of £3 and £2 respectively, which are awarded every year for the two highest yields. These prizes were secured this year by Messrs. Twartz and Thomas.

The heaviest weight per bushel was Mr. R. S. Goldney's King's Red (65½lbs.), the highest last year being 65lbs.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, July 9th, there being present Messrs. A. M. Dawkins, J. Miller, Geo. Jeffrey, G. R. Laffer, W. G. Auld (President Vinegrowers' Association), T. H. Williams, C. E. Birks, F. Coleman, Col. Rowell, C.B., Professors Lowrie and Perkins, and G. G. Nicholls (Secretary).

APPOINTMENT OF OFFICERS.

Mr. Dawkins read a letter from the Minister of Agriculture, intimating that he had reappointed Messrs. Geo. Jeffrey, A. M. Dawkins, Col. Rowell, and the President of the Vinegrowers' Association as members for a further period of two years from July 1st. On the motion of Col. Rowell Mr. G. R. Laffer was elected Chairman and Mr. F. Coleman Vice-Chairman. In nominating Mr. Laffer, Col. Rowell, C.B., paid a merited tribute to the valuable services which his predecessor, Mr. A. M. Dawkins, had rendered in the position. Mr. J. Miller, in seconding, mentioned that Mr. Laffer, who had previously occupied the chair for a term, had the confidence of every member of the board. Mr. Laffer acknowledged the compliment, and extended a cordial welcome to Mr. W. G. Auld, who, as President of the Vinegrowers' Association, had succeeded Mr. G. F. Cleland.

HORSE-BREEDING SOCIETIES.

A suggestion was received from the Warcowie Branch that the nomination fee under the regulations governing the formation of horse-breeding societies should be reduced from four guineas to three guineas per mare, and that the number of mares to be served by one stallion should be limited to 70 instead of 80. Professor Lowrie pointed out that this could not be adopted. Under the scheme originally submitted by himself the number of mares was restricted to 70, but most of the farmers with whom he discussed the matter considered that it was too low. The nomination fee had to be governed by the funds of the society and the need for securing the services of a good stallion.

AGRICULTURAL TESTS, EYRE PENINSULA.

Relatively to the desire of the Shannon Branch that the Government should test some of the land in the vicinity of Minnipa Hill with superphosphates, wheat, and oats, the Minister wrote that it was too late to comply with the request this season, but it would be kept in mind for next season.

TREE-PLANTING ON RESERVES.

At the instance of Mr. Dawkins it was decided to ask the Minister to secure a report from the Conservator of Forests upon a request from the Yongala Vale Branch, that the reserves in the hundred of Belalie, adjoining sections 142, 143, and 180, should be planted with trees.

AUSTRALIAN FOREST LEAGUE.

Letters from the provisional committee of the South Australian Branch of the Australian Forest League were received. Members were fully in accord with the objects of the league, and the secretary was instructed to inform the secretary accordingly.

NEW BRANCHES.

Approval was given to the formation of new Branches of the Bureau at Parilla and Bandon, on the Brown's Well line, with the following gentlemen as members :—Parilla—Messrs. A. J. Stevens, H. G. Johnson, J. Roachock, G. Neindorf, M. Shannon, P. J. Brown, J. H. Daniel, G. Gregory, C. Millstead, P. Harrip, J. J. Foale, L. Shannon, J. Lee, T. Kerby, P. O'Driscoll, D. McPherson, P. Lewis, J. H. Dewhurst; Bandon—Messrs. W. Johns, J. D. Lee, W. Spurling, J. T. Corbett, R. Copp, P. Purdie, H. Cope, jun., W. H. Spurling, G. G. White, J. T. Retallack, C. A. Evans, L. Dohnt, H. Knowles, M. Walsh, G. Retallack, A. Dohse, W. Burdett, A. Purdie, L. R. Purdie, H. S. Cope, W. Johns, jun.

LIFE MEMBERS.

The following gentlemen were approved as life members of the Bureau, viz. :—Messrs. W. H. Hughes (Longwood), and Samuel Solly (Watervale).

NEW MEMBERS.

The following new members were approved at the Branches shown, viz. :—Yongala Vale—G. Keatley; Borrika—C. H. A. Tonkin, J. Wright; Mount Bryan East—E. S. Wilks, W. Campbell; Georgetown—J. Buchan, H. L. Saunders, E. B. Tucker, H. Tucker, W. Mackwood; Berri—J. Wack, V. Fowles; Hawker—W. A. Reid; Redhill—A. Dick; Salisbury—A. R. M. Basford, B. Rumball, F. J. Fleet; Shannon—R. Brown, P. Fitzgerald, H. Schmidt; Pine Forest—E. Hewett; Geranium—W. Morcom, F. Norton, sen., E. Nickols, W. G. Nickols, E. Winch; Millicent—J. B. Mitchell, T. W. Kealy; Blyth—F. Wiltshire, J. H. Pratt, A. D. Pedlar; Pinnaroo—J. Pitkin; Hookina—H. Huddleston, F. Stone; Yabmana—F. W. Beinke; Northfield—A. Lowe, J. Eisele; Wirrabara—L. S. Cobiac, H. Francis, W. Rooke; Yongala Vale—J. I'Anson; Elbow Hill—P. C. Wheeler; Hooper—F. Yates, D. Murphy, C. W. Shultz, J. Schultz; Strathalbyn—W. H. Cumming, F. M. Michelmore; Lyndoch—A. Threadgold; Uraidla and Summertown—J. McAskill, F. H. Stacey, G. Collett; Watervale—J. L. Broadbent, F. J. Mutton, J. Ward, sen.; Lameroo—O. W. Davidson,

E. F. Davidson, G. A. Martin; Morphett Vale—S. Pocock; Koppio—J. Liddy; Coonalpyn—J. J. Angel, D. T. Cronin; Davenport—G. Goldner; Willowie—A. Bull, A. G. Blight; Renmark—J. E. Smith; Pine Forest—I. Edwards; Paskeville—R. Petherick, A. Petherick; Yallunda—W. E. Rolland, W. Forrest, E. Walsh, W. Winstanley, R. B. Jenkins; Keith—A. V. Shannon, S. C. R. Hantke; Woodside—W. Rollbusch, A. J. McCarthy, H. Howell; Morchard—W. Keauschner; Meningie—L. D. Martin.

VINEYARD AND ORCHARD PRODUCTION, 1912-13.

A RECORD VINTAGE.

The Government Statist (Mr. L. H. Sholl, C.M.G.) has issued the official return of yields of the vineyards and orchards of the State for the past season. The figures relating to vineyards make particularly pleasant reading, as it is shown that there was a substantial increase in the acreage under cultivation and the yield, while the quantity of wine made established a record. Excluding gardens of less than one acre in extent, the yield of grapes was 42,605 tons, or 2·00 tons per acre of the vines of bearing age, compared with 34,591 tons, or 1·67 tons per acre for the previous season. A total of 24,853 tons were used for wine-making, the quantity of wine made amounting to 3,974,838galls. This exceeds the previous record vintage of 3,470,058galls in 1911 by 504,780galls. Of the quantity made, 1,722,008galls. will probably be distilled. A reference to the results of the last five vintages shows that approximately one-half of the total wine made has been used for distillation purposes. Of currants, 52,208cwts. were dried, being an increase of 5,513cwts. Raisins.—Sultanas, 16,575cwts., increase 1,832cwts; all other, 18,673cwts., decrease 1,235cwts.

STATEMENT OF AREA AND PRODUCTION OF VINEYARDS FOR THE FIVE SEASONS, 1908-9 TO 1912-13.

Seasons	Total Area (Bearing and not Bearing).	Grapes Gathered.		Wine made.	Currants Dried.	Raisins Dried.
		Total.	Average per acre of Bearing Age.			
	Acres.	Tons.	Tons.	Gallons.	Cwts.	Cwts.
1908-9......	22,031	34,697	1·73	3,132,247	24,449	28,007
1909-10	22,441	31,040	1·52	2,569,797	36,052	27,808
1910-11	22,952	36,861	1·81	3,470,058	40,261	34,745
1911-12	23,986	34,591	1·67	2,921,597	46,695	34,651
1912-13	25,208	42,605	2·00	3,974,838	52,208	35,248
Average for five seasons	23,324	35,959	1·75	3,213,707	39,933	32,092

EXPORTS OF WINE.

A substantial export trade in wine and brandy made from wine is carried on with the other Commonwealth States ; but as it is not recorded, the following statement is confined to the exports of wine to countries beyond the Commonwealth.

Wine.	Oversea Exports for Years—				
	1908.	1909.	1910.	1911.	1912.
Gallons	320,438	520,269	449,673	585,603	461,414
Value .... £	32,634	53,325	48,414	66,617	53,763

For the years 1908 and 1909 (the last two years for which complete inter-State records are available) the export to other States were respectively 440,088galls. and 525,409galls. Since 1909 it is estimated that the exports have ranged from 520,000galls. to 550,000galls. annually.

On this estimate the exports oversea and inter-State for 1912 were 1,011,414galls., with an average annually for the last five years of 978,579galls.

VALUE OF PRODUCTION.

The following statement shows the estimated value of vineyard production grapes for table, currants, raisins, and wine made) for the seasons 1908-9

to 1912-13 and the percentage of value to total value of all crops, and the average value per acre of vines of bearing age.

Seasons.	Total Value.	Value of Vineyard Production.	
		Percentage to Total Value of all Crops.	Value Yield per Acre of Vines of Bearing Age.
	£	£ s. d.	£ s. d.
1908–9	354,160	5 0 2	17 13 6
1909–10	319,580	4 6 7	15 14 0
1910–11	455.291	6 8 4	20 19 2
1911–12	426,841	5 14 1	20 12 4
1912–13	544,232	6 17 8	25 9 9
Average five seasons ..	420,021	5 13 9	20 8 6

ORCHARDS.

ACREAGE.

The area under fruit culture has been steadily increasing during the last five years. The latest returns show that 23,905 acres are devoted to this purpose. Of this acreage the trees which have reached bearing age account for 16,875 acres ; and the trees which have not yet reached bearing age, 7,030 acres.

PRODUCTION.

In addition to the fruits mentioned below considerable quantities of berry and bush fruits are produced, also almonds and olives.

Kinds.	Seasons and Quantities of Fruit Produced.				
	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
Apricots	113,356	123,517	145,213	165,982	116.366
Apples	398,812	557,130	476,904	583,860	448,468
Pears	74,728	69,459	80,868	81,644	91.533
Cherries	60,077	62,277	45,085	42,607	28,313
Plums	64,852	115,956	94,217	106,758	83,053
Oranges	176,732	152,416	153,464	220,988	137,031
Lemons	41,808	39,437	44,799	47,176	31,515
Peaches and Nectarines ..	59,616	62,746	59,406	80,315	72,509

DRIED FRUITS.

The quantity of the different kinds of fruit dried for each of the last five seasons is as follows :—

Seasons.	Quantities of Different Kinds of Fruits Dried.				
	Apricots.	Apples.	Pears.	Peaches.	Plums and Prunes.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
1908–9..	2,909	2,215	462	1,110	991
1909–10	5,309	1,694	435	880	1,628
1910–11	5,855	1,160	260	917	836
1911–12	6,342	818	400	1,351	1,514
1912–13	3,908	1,208	550	1,180	592
Average five seasons	4,865	1,419	421	1,088	1,112

VALUE OF PRODUCTION.

The estimated value of the products of the orchards and gardens for each of the last five seasons, the percentage of such value to the total value of all crops, and the average value per acre of trees of bearing age, is as follows :—

Seasons.	Value of Orchard and Garden Production.						
	Total for State.	Percentage to Value of all Crops.			Value Yield per Acre of Trees of Bearing Age.		
	£	£	s.	d.	£	s.	d.
1908-9	283.070	4	0	1	19	0	3
1909-10	354,358	4	16	0	23	1	5
1910-11	343,941	4	17	0	21	16	1
1911-12	376,915	5	0	9	22	19	9
1912-13	393,433	4	19	6	23	6	3
Average five seasons	350,343	4	14	10	22	1	2

* * *

ANALYSES OF FERTILISERS.

The following table gives the results of the analyses made by the Government Analyst (Mr. W. A. Hargreaves, M.A.) of further samples of fertilisers taken by the inspectors under the Fertilisers Act since the beginning of the year 1913:—

Name of Firm and Fertiliser.	Phosphate.						Total Phosphoric Acid, calculated as Tricalcic Phosphate	Nitrogen.	
	Water Soluble.		Citrate Soluble.		Acid Soluble.				
	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Result of Analysis.	Vendor's Guarantee
	°/o	°/o	°/o	°/o	°/o	°/o	°/o	°/o	°/o
Hackett, E. & W.—									
Whale guano ex *Australic*	—	·43	—	7·97	—	4·58	28·04	5·74	5·74
Whalebone powder ex *Australic*	—	·30	—	9·81	—	13·54	49·62	3·47	3·47
Hasell, A. H.—									
Marion rock phosphate	—	—	—	—	69·75	60·00	—	—	—
Nitrate of soda	—	—	—	—	—	—	—	16·04	15·00
Indian guano	—	—	13·55	13·11	50·08	50·25	63·63	·40	·50
S.A. Farmers' Co-op. Union, Ltd.—									
Wallaroo bone super...........	31·07	25·00	7·78	5·00	4·98	10·00	43·83	1·48	1·00

GEO. QUINN, Inspector of Fertilisers.

THE WHEAT MARKET.

Under date London, July 4th, *Beerbohm's Corn Trade List* states, in regard to the wheat position — "The demand continues very quiet for wheat in all positions, and prices have declined 3d. to 6d. for practically all descriptions. There was rather a steadier tone at the close yesterday, and this may be attributed to the very unsatisfactory state of affairs in the Balkans. The crops are now ready to be harvested, and if the fighting continues it may be difficult to save them, with so many men engaged in the war and the consequent shortage of labor. Unless some of the other powers become involved, the effects of the war, so far as supplies of grain are concerned, will be mainly confined to the countries interested in the war. There is no particular change in the general situation. The weather has been favorable on the whole for the wheat crops in importing countries, and harvest is gradually extending in Italy and the south of France, so that the demand for foreign wheat continues small. The latest reports from Russia and Roumania are very favorable, and so far as the yields are concerned promise to be fully satisfactory. A good deal of rain, however, has fallen in South Russia, and if it continues for any length of time will affect the quality.

It will be seen by the tabular statement given below that there has been a very large decrease in the world's visible during June."

THE WORLD'S VISIBLE WHEAT SUPPLY ON JULY 1ST.

	July 1st. 1913. Qrs.	June 1st. 1913. Qrs.	July 1st. 1912. Qrs.	July 1st. 1911. Qrs.
Afloat—U.K.	3,425,000	3,815,000	3,285,000	3,140,000
" Continent	2,165,000	3,430,000	2,560,000	2,350,000
Stocks in U.K., wheat and flour in first hands	2,200,000	1,500,000	2,100,000	1,700,000
Stocks in French ports	150,000	200,000	150,000	750,000
Stocks in Paris	15,000	30,000	10,000	45,000
" Antwerp	250,000	200,000	180,000	250,000
" German ports	210,000	200,000	280,000	250,000
" Russian ports	500,000	700,000	900,000	1,200,000
Total in Europe	8,915,000	10,075,000	9,465,000	9,685,000
Bradstreet's visible supply in America and Canada	6,525,000	8,440,000	5,745,000	4,945,000
Visible Supply in Argentina	185,000	340,000	340,000	205,000
Grand Total, July 1st	15,625,000	18,855,000	15,550,000	14,835,000
" " June 1st	18,855,000	—	19,660,000	17,010,000

	European. Qrs.	U.S.-Canada. Qrs.	Total. Qrs.	Eng. Average Price.	
				s.	d.
1913	8,915,000	6,525,000	15,440,000	32	8
1912	9,465,000	5,745,000	15,210,000	37	10
1911	9,685,000	4,945,000	14,630,000	31	10
1910	8,195,000	3,135,000	11,330,000	29	9
1909	6,835,000	2,400,000	9,235,000	42	8
1908	7,035,000	2,800,000	9,835,000	31	5
1907	8,430,000	8,250,000	16,680,000	31	2
1906	8,470,000	4,550,000	13,020,000	30	3
1905	9,020,000	2,650,000	11,670,000	31	9
1904	9,315,000	2,800,000	12,115,000	26	9
1903	6,960,000	3,250,000	10,210,000	27	6
1902	6,895,000	3,765,000	10,660 000	30	5

Date.		LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
July	5	Quiet; Liverpool steady, but quiet	3/6 to 3/6½	3/7	3/6¾
	7	—	Do.	Do.	Do.
	8	Firm; Liverpool steady, no quotation	Do.	3/7½	3/7
	9	Steady, but quiet	Do.	Do.	Do.
	10	Quiet	Do.	3/7 to 3/7½	3/6½ to 3/6¾
	11	Firm, and more inquiry; Liverpool steady, no quotation	Do.	Do.	3/6¾ to 3/7
	12	Firm, June-July 4/7⅞; Liverpool firm, but quiet	3/6½ to 3/7	Do.	Do.
	14	—	Do.	Do.	3/7
	15	Dull with easier tendency	Do.	3/7½	Do.
	16	Do.	Do.	3/8	Do.
	17	Quiet	Do.	3/8 to 3/8¼	Do.
	18	Dull	Do.	Do.	Do.
	19	Steady, but quiet; Australian arrived 4/6¾d.	Do.	Do.	Do.
	21	—	Do.	Do.	Do.
	22	Firm, but quiet; Liverpool steady; Australian, off coast, 4/7⅞	Do.	3/7½ to 3/8	3/7½
	23	Firm, but quiet; Liverpool steady; Australian, afloat, 4/7⅞	Do.	Do.	Do.
	24	Steady, but quiet	Do.	3/7½ to 3/7¾	3/7 to 3/7½
	25	Firm; Australian, afloat, sellers at 4/8¼; Liverpool firm, inactive	Do.	Do.	Do.
	26	Steady, but quiet	Do.	Do.	Do.
	28	—	Do.	3/7¾	3/7½
	29	Dull, easier tendency; Liverpool quiet	Do.	Do.	Do.
	30	Dull, easier tendency	Do.	Do.	Do.
	31	Very dull	Do.	Do.	Do.
Aug.	1	Dull and neglected	Do.	3/7½ to 3/7¾	3/7 to 3/7½
	2	Very dull, no demand	Do.	Do.	Do.
	4	—	Do.	3/7¾ to 3/8	Do.

Steamer Freights.—(August 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 28s. 9d. to 30s. per ton (9¼d. to 9⅝d. per bushel); to South Africa, 27s. per ton (8 7/10d. per bushel). Parcels, Port Adelaide to London-Liverpool, 30s. per ton (9⅝d. per bushel); to Continent, 30s. per ton (9⅝d. per bushel); Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel); to Sydney, 10s. 6d. per ton (3⅜d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 28s. to 28s. 9d. per ton (9 1/10d. to 9¼d. per bushel); to South Africa, 25s. per ton (8d. per bushel).

RAINFALL TABLE.

The following table shows the rainfall for July, 1913, at the undermentioned stations, also the average total rainfall for the first seven months in the year, and the total for the seven months of 1912 and 1913 respectively:—

Station.	For July, 1913.	Av'ge. to end July.	To end July, 1912	To end July, 1913.	Station.	For July, 1913.	Av'ge. to end July.	To end July, 1912.	To end July, 1913.
Adelaide ...	0·74	12·67	10·20	7·13	Hamley Brdge	0·57	9·67	5·36	6·02
Hawker	0·14	6·85	6·26	2 62	Kapunda ...	0·78	11·56	6·53	8·85
Cradock	0·10	6·28	3·55	3·03	Freeling	0·74	10·34	6·32	10·57
Wilson......	0·08	6·86	6·14	3·10	Stockwell ...	0·83	11·70	7·91	8·61
Gordon	0·06	8·72	4·33	2·99	Nuriootpa ..	0·93	12·28	7·56	8·27
Quorn	0·48	7·69	8·97	2·92	Angaston ...	1·23	12·44	10·06	11·41
Port Augusta	0·23	5·50	5·31	2·59	Tanunda ...	1·69	12·84	11·81	10·90
Port Germein	0·48	7·30	4·98	2·82	Lyndoch ...	1·32	13·43	9·04	8·52
Port Pirie ..	0·52	7·61	4·90	3·41	Mallala	0·81	9·97	6·13	5·99
Crystal Brook	0·88	8·68	6·73	3·16	Roseworthy..	0·75	10·22	5·93	6·45
Pt. Broughton	1·16	8·48	7·40	3·52	Gawler	1·37	11·42	6·95	7·00
Bute	1·18	9·16	6·64	5·55	Smithfield ..	0·93	9·93	6·54	6·70
Hammond ..	0·25	6·18	4·58	2·57	Two Wells ..	0·81	10·31	5·46	5·09
Bruce	0·21	5·17	5·97	3·33	Virginia.....	1·31	10·58	5·97	6·14
Wilmington .	0·68	10·20	11·05	3·75	Salisbury ...	1·26	11·13	7·66	7·35
Melrose	0·69	13·62	11·46	4·13	Teatree Gully	1·62	17·00	11·91	8·34
Booleroo Cntr.	0·32	8·92	5·79	2·41	Magill	1·04	15·69	11·20	8·04
Wirrabara...	0·77	10·87	9·09	4·31	Mitcham ...	1·38	14·66	9·41	7·93
Appila	0·32	8·35	9·89	2·79	Crafers	3·05	27·69	19·88	14·74
Laura	0·71	9·96	6·40	3·21	Clarendon ..	1·82	20·47	12·98	10·14
Caltowie	0·75	9·47	5·82	3·85	Morphett Vale	1·49	14·26	8·97	7·99
Jamestown .	0·93	9·47	8·91	4·20	Noarlunga ..	0·83	12·40	8·65	5·81
Gladstone ..	0·72	8·76	5·56	3·53	Willunga ...	1·74	15·79	10·62	10·24
Georgetown...	1·05	10·50	7 40	3·91	Aldinga	0·92	12·53	8·18	7·46
Narridy	1·01	9·64	7·19	3·02	Normanville	1·01	12·84	7·66	8·22
Redhill.......	1·27	9·56	8·25	4·10	Yankalilla...	1·21	14·15	9·63	10·46
Koolunga....	0·76	9·00	7·31	3·49	Eudunda....	0·69	9·58	7·56	7·89
Carrieton ...	0·20	6·63	5·10	2·50	Sutherlands	1·00	5·44	5·33	5·03
Eurelia.......	0·24	7·18	6·21	2·23	Truro.......	1·26	11·06	9·64	11·53
Johnsburg ..	0·14	5·26	5·66	2·48	Palmer	1·02	—	6·68	8·21
Orroroo	0·38	7·84	5·43	3·14	Mt. Pleasant.	2·56	16·07	9·04	10·79
Black Rock...	0·27	6·83	5·42	3·07	Blumberg ..	2·97	17·83	10·53	7·18
Petersburg ..	0·67	7·12	6·49	5·23	Gumeracha .	3·13	19·57	12·90	10·58
Yongala	0·63	7·44	5·46	3·14	Lobethal ...	2·77	21·27	12·47	10·40
Terowie	0·59	7·28	5·75	3·91	Woodside ...	2·94	18·44	12·65	11·13
Yarcowie ...	0·58	7·62	6·44	5·01	Hahndorf ...	2·59	20·68	13·34	12·96
Hallett	0·86	9·10	6·39	5·31	Nairne	2·07	16·95	10·07	10·01
Mount Bryan	1·03	8·91	7·32	6·69	Mt. Barker .	2·19	18·21	11·81	11·45
Burra	0·92	10·23	8·82	5·25	Echunga ...	2·70	19·39	13·02	11·24
Snowtown...	0·95	9·13	7·69	3·72	Macclesfield ..	2·40	17·59	11·15	12·75
Brinkworth .	1·17	8·52	8·13	5·04	Meadows.....	3·35	20·86	13·97	14·07
Blyth.......	0·90	9·48	6·77	5·16	Strathalbyn..	1·31	11·27	8·14	9·63
Clare........	1·15	4·22	10·08	6·98	Callington ..	0·63	9·32	4·90	6·90
Mintaro Cntrl.	0·96	12·49	7·78	5·56	Langh'rne's B.	0·69	8·95	5·10	6·04
Watervale...	1·20	15·83	9·88	9·04	Milang	0·54	10·31	5·01	5·13
Auburn	1·05	14·07	7·39	5·95	Wallaroo ...	0·98	8·65	9·65	5·22
Manoora ...	0·70	10·07	5·89	4·96	Kadina......	0·95	9·94	8·73	4·80
Hoyleton ...	0·83	10·74	5·28	4·14	Moonta	1·32	9·62	8·08	5·74
Balaklava ..	0·49	9·43	4·89	3·72	Green's Plns..	1·09	9·52	6·55	4·35
Pt. Wakefield	0·65	8·15	5·34	4·18	Maitland ...	1·26	12·41	7·63	6·75
Saddleworth..	0·75	11·70	6·04	6·39	Ardrossan ..	0·96	8·43	6 20	5·45
Marrabel ...	0·72	10·91	5·30	5·96	Pt. Victoria..	1·11	9·50	7·23	4·19
Riverton ...	0·80	11·86	6·35	7·11	Curramulka...	1·35	11·42	6·28	6·14
Tarlee.......	0·63	10·04	6·26	6·48	Minlaton ...	0·90	10·70	6·26	4·54
Stockport ..	0·56	9·39	5·26	6·41	Stansbury....	1·56	10·28	7·34	6·90

RAINFALL TABLE—*continued.*

Station.	For July, 1913.	Av'ge. to end July.	To end July, 1912.	To end July, 1913.	Station.	For July, 1913.	Av'ge. to end July.	To end July, 1912.	To end July, 1913.
Warooka.....	1·29	10·93	7·54	5·01	Wolseley ...	1·27	9·89	5·53	6·46
Yorketown .	1·45	10·70	7·50	4·93	Frances	1·12	11·14	8·27	6·42
Edithburgh .	1·30	10·15	6·80	6·30	Naracoorte .	1·99	12·80	9·05	8·50
Fowler's Bay.	0·79	8·30	7·12	6·19	Lucindale ..	2·47	13·47	9·28	7·66
Streaky Bay.	0·95	9·98	9·06	6·30	Penola.......	1·69	15·25	12·05	8·13
Port Elliston.	1·12	10·56	9·45	4·20	Millicent ...	3·06	17·74	13·67	12·80
Port Lincoln.	1·97	12·44	12·65	6·28	Mt. Gambier.	2·97	18·34	13·90	12·10
Cowell	0·79	7·00	6·76	3·41	Wellington .	0·71	8·80	5·51	6·39
Queenscliffe...	2·41	11·61	10·10	7·46	Murray Brdg.	0·48	8·27	4·48	9·10
Port Elliot .	1·54	12·53	8·44	7·56	Mannum ...	0·31	7·00	4·37	5·97
Goolwa......	1·17	10·76	8·87	7·01	Morgan	0·21	4·92	4·70	3·27
Meningie ...	0·45	11·39	6·94	6·26	Overlnd. Crnr.	0·26	6·30	5·13	6·19
Kingston....	1·97	15·18	15·18	9·25	Renmark ...	0·14	5·71	4·57	6·16
Robe	2·88	15·39	9·92	8·92	Lameroo ...	1·09	—	8·72	7·83
Beachport...	2·49	17·21	11·63	11·01	Tintinara ...	0·74	—	—	—
Coonalpyn ..	0·58	10·24	7·63	6·60	owie ...	0·20	—	—	—
Bordertown...	1·18	11·26	5·86	7·62					

TO ADVERTISERS.

The "Journal of Agriculture" has a circulation of over 6,500 Copies monthly amongst the Cultivators of the Soil in South Australia, and consequently is a valuable medium for advertising Farm and Orchard Supplies and Requisites.

Particulars as to charges for space on application to the Department of Agriculture, Adelaide.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on August 1st—

Butter.—The butter and cream received during July increased in quantity. Local production, however, is still behind requirements, and values in factory butters are only a shade easier than a month ago. Best factory and creamery, fresh in prints, sold at 1s. 2d. to 1s. 3½d. per lb.; choice separators and dairies, 1s. 0½d. to 1s. 1½d.; store and collectors', 10½d. to 11½d. per lb.

Eggs.—The seasonable increase has set in, and with inter-State trade rather dull values have receded very considerably since the beginning of July. Guranteeed new-laid hen are 9¾d. per dozen; duck, 10½d.

Cheese.—Prices show an advance of about a halfpenny during the month owing to stocks running down. However, many factories are forwarding increasing quantities, and lower rates are therefore anticipated. Values—7¼d. to 7¾d. per lb. for large to loaf.

Honey.—There is a good demand for prime clear extracted at 3d. to 3¼d., but second grades are selling slowly at 1½d. to 2d.; beeswax is very saleable at 1s. 2d. to 1s. 2½d.

Almonds are being speedily placed at the advance lately established, viz., Brandis, 5¾d.; mixed soft shells, 5¼d.; hard shells, 3d.; kernels, 1s. 4d.

Bacon.—Supplies of bacon are still arriving from the east, as the shortage of live hogs in this State continues. The trade in sides and middles has tended to be a little dull, but this is only to be expected at this particular time of year. On the whole, fair quantities have been put through at—Best factory cured sides, 9½d. to 10d.; hams, cooked, 11d. to 1s.; uncooked, 9d. to 10d.; well cut and cured farm middles and rolls, 7d. to 8½d.

Live Poultry.—Increasing quantities have been submitted at our mart lately, the restrictions preventing the sale of poultry at the Adelaide live market having, no doubt, attracted consignments here; but as the demand has been exceptionally keen all lots have been readily cleared at prices showing an improvement on previous month's rates. Good table roosters realised 3s. to 3s. 7d. each; plump hens and nice-conditioned cockerels, 2s. to 2s. 6d., only a few coops of light and mixed sorts selling down to 1s. 6d. to 1s. 8d.; ducks, 2s. 9d. to 3s. 10d.; geese, 4s. to 5s.; pigeons, 7½d.; turkeys, from 7d. to 10d. per lb. live weight for fair to prime table birds.

Potatoes and Onions.—There have been heavy supplies of potatoes from Mount Gambier and Ballarat during the last month. The price of Victorians has eased considerably, but owing to the more reliable samples offering at Mount Gambier the latter market has so far managed to stand its ground. Onions.—Until recently the Adelaide market has been supplied from local sources, but a demand has now set in for Victorian and Mount Gambier onions, and consequently prices are on a firmer basis. Quotations—Potatoes.—Gambiers, £4 10s. per ton on trucks, Adelaide or Port; 5s. to 6s. 6d. per cwt. in the market. Onions—Gambiers, £7 10s. per ton on trucks, Adelaide or Port; 7s. 6d. to 8s. 6d. per cwt. in the market.

The General Manager of the Produce Department reports on August 1st—

Butter.—The supply of cream to hand last month was much larger than for the corresponding period last year, and was of first-class quality. It is also very pleasing to note that the quantity coming to hand is steadily increasing. There has not been much fluctuation in the price for the month, and the present quotations are—Superfine, 1s. 3d. per lb.; pure creamery, 1s. 2d. per lb.

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.	
		Aug.	Sept.
Amyton	73	—	—
Angaston	*	16	13
Appila-Yarrowie	†	—	—
Arden Vale & Wyacca	73	—	—
Arthurton	†	—	—
Balaklava	89	—	—
Bandon	*	—	—
Beetaloo Valley	†	—	—
Belalie North	*	16	13
Berri	102	16	13
Blackwood	113	11	8
Blyth	90	16	20
Booleroo Centre	81	8	—
Borrika	*	—	—
Bowhill	*	—	—
Bowmans	*	14	11
Burra	*	15	12
Bute	*	—	—
Butler	*	—	—
Caltowie	*	16	13
Canowie Belt	81	—	—
Carrieton	†	14	11
Cherry Gardens	113	12	9
Clanfield	104	—	—
Clare	*	15	12
Clarendon	*	11	15
Claypan Bore	105	12	5
Colton	†	16	13
Coomandook	105	—	—
Coomooroo	74	16	20
Coonalpyn	106	—	—
Coorabie	95-6	—	—
Cradock	†	—	—
Crystal Brook	‡	—	—
Davenport	74	—	—
Dawson	*	—	—
Dingabledinga	*	8	12
Dowlingville	*	—	—
Elbow Hill	*	—	—
Forest Range	*	14	11
Forster	106	—	—
Frances	124	15	12
Freeling	*	—	—
Friedrichswalde	†	—	—
Gawler River	*	—	—
Georgetown	83	16	13
Geranium	*	30	27
Gladstone	82	—	—
Glencoe	124	—	—
Goode	97	—	—
Greenock	*	—	—
Green Patch	*	11	15
Gumeracha	114	12	9
Hartley	114	13	10
Hawker	75	11	15
Hookina	75	12	9
Hooper	107	29	26
Inman Valley	115-18	—	—
Ironbank	†	15	12
Julia	83	16	13
Kadina	*	12	9
Kalangadoo	*	9	13
Kanmantoo	119	16	13
Keith	125	16	13
Kingscote	*	5	2
Koppio	†	14	11
Kybybolite	†	14	11
Lameroo	108	—	—
Leighton	†	—	—
Lipson	*	—	—
Longwood	†	13	10
Loxton	†	—	—
Lucindale	†	23	20
Lyndoch	*	14	—
MacGillivray	*	12	—
Maitland	†	7	4
Mallala	*	4	1
Mangalo	98	16	13
Mannum	*	30	27
Meadows	120	11	15
Meningie	121	16	13
Millicent	*	12	9
Miltalie	98	16	13
Minlaton	*	14	11
Mitchell	*	16	13
Monarto South	109	16	—
Monteith	109	—	—
Moonta	†	13	—
Moorlands	*	—	—
Morchard	75	16	13
Morgan	†	—	—
Morphett Vale	121	—	—
Mount Barker	122	13	10
Mount Bryan	*	16	13
Mount Bryan East	†	2	6
Mount Gambier	†	9	—
Mount Pleasant	†	8	12
Mount Remarkable	76	13	10
Mundoora	*	—	—
Nantawarra	90	13	10

INDEX TO AGRICULTURAL BUREAU REPORTS—*continued.*

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings	
		Aug.	Sept.			Aug.	Sept.
Naracoorte	125	9	13	Spalding	87-8	15	19
Narridy	*	—	—	Stockport	†	—	—
Narrung	†	—	—	Strathalbyn	*	—	—
North Booborowie	84	13	—	Sutherlands	112	16	13
Northfield	91	5	2	Tarcowie	78	12	9
Orroroo	76	9	13	Tatiara	†	2	6
Parilla	†	—	—	Tintinara	126	2	—
Parilla Well	*	—	—	Two Wells	93	—	—
Parrakie	09-10	2	6	Uraidla and Summert'n	123	4	1
Paskeville	*	14	11	Utera Plains	100	16	13
Penola	126	2	6	Waikerie	†	14	15
Penong	99	9	13	Warcowie	*	—	—
Petina	*	—	—	Watervale	93	11	8
Pine Forest	94	12	9	Wepowie	78	—	—
Pinnaroo	110	—	—	Whyte-Yarcowie	*	—	—
Port Broughton	84	15	12	Wilkawatt	†	—	—
Port Elliot	123	16	20	Willowie	78-80	8	5
Port Germein	85	9	20	Willunga	*	2	6
Port Pirie	85	2	6	Wilmington	†	13	10
Quorn	77	16	—	Wirrabara	80	16	—
Redhill	86	12	9	Wirrega	†	9	6
Renmark	111	—	—	Woodside	123	—	—
Riverton	91	—	—	Yabmana	101	—	—
Roberts and Verran	99	12	9	Yadnarie	*	16	13
Saddleworth	92	15	19	Yallunda	101	—	—
Salisbury	93	5	2	Yongala Vale	89	11	15
Shannon	*	—	—	Yorketown	*	9	13
Sherlock	*	—	—				

* No report received during the month of July. † Formal report only received.
‡ Report omitted owing to pressure on space.

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ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

September 3rd and October 8th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD)

Amyton, July 15.

(Average annual rainfall 11·82in.)

Present.—Messrs. T. O'Donoghue (chair), W. and H. K. Gum, S. Thomas, J. J. Cormack, A. J. Phillis, L. H. Mills, T. Ward, M. Corcoran, R. Brown, A. Crisp (Hon. Sec.), and two visitors.

Fowl Tick —Mr. Brown read a paper in which he drew attention to the loss which the poultry industry was sustaining through the ravages of the tick. Various means of destroying the pest had been suggested, such as dipping the fowls in a weak solution of sheep dip, or smearing them with a mixture of kerosine and oil. These were not effective, however, whilst the tick had access to the roosts He had noticed that the pests were unable to climb the sides of a glass bottle, and set about erecting a fowl house as follows :—He put props in the ground about 10ft. apart, and hung wires from rafters on these for the support of the hen roost. Bottles, neck downwards, with the bottoms knocked out were hung on these wires. The perches were then hung at the required height. The house could then be erected to the desired size. Plain and netting wires were put outside the props and then straw to protect the fowls from the weather. The perch should not touch any part of the house. He had secured very satisfactory results. Mr. Gum preferred all iron houses—old tyre iron being used for uprights and rafters; galvanized iron being bolted to this When tick got into a house of this kind, straw could be burned in it, which would effectively destroy them. Mr. Kitto recommended scalding the roosts with boiling soapsuds.

Arden Vale and Wyacca, July 14.

(Average annual rainfall, 16·65in.)

Present.—Messrs. J. H. Williss (chair), M. and O. Echert, J. Absalom, H. Liebich, P. A. Hannemann, E., J., and T. Klingberg, R. Paynter, O. E. Hannemann (Hon. Sec.), and six visitors.

Mustard.—In a short paper Mr. R. Paynter said mustard throve best on fallow : and whilst it was a good fodder, it was a pest in a crop to be cut for hay or harvested. The best means of ridding the land of it was to run horses on the stubble, burning it as soon as possible. The land should then be ploughed whilst dry and harrowed after every rain. Then, as the mustard grew, it should be fed off with sheep or cattle, and the plough or cultivator should go over it when it showed up green in the spring. It grew best when the rainfall was below the average. Mr. Echert thought that whilst this weed was troublesome in a crop for binding, it did not spoil the chaff for sale purposes in any way, and it was a good fodder. Members generally concurred.

Coomooroo, July 19.

(Average annual rainfall, 11in. to 12in.)

PRESENT.—Messrs. C. Berriman (chair), W. Robertson, J. Brown, G. B. Lillicrapp, H. E. Fisher, C. Phillis, E. Brice, R. Brice, W. M. Robertson (Hon. Sec.), and one visitor.

VETERINARY EXAMINATION OF STALLIONS.—Mr. W. Robertson contributed the following paper on this subject:—"The compulsory examination of stallions by a veterinary surgeon at the subsidised shows is a practice which has passed the experimental stage, and I think is recognised by most horseowners to be sound in principle and calculated to increase the usefulness of the horse, to improve his value, and to put the industry of horse-breeding on a more profitable basis by reducing the chances of loss from breeding an unsound animal. But there is one aspect of the question which so far has not received as much attention as it should. A considerable number of stallions which pass the veterinary test and are exhibited at the shows are partially or wholly useless for getting foals. This may be beyond the veterinary surgeon's power to detect, but some guarantee is required, either by records or otherwise, that the horse which takes a prize shall be capable of performing the service for which he was reared." Mr. J. Brown, in opening the discussion, said that owners of mares preferred to breed from a horse which had passed a veterinary examination. A horse might leave a good percentage one season and very few the next. This would depend to a certain extent on the health of the horse and the number of mares served. It was a great mistake to give a young horse too many mares, and also to have a stallion too fat. Mr. Lillicrapp said that one reason why many stallions did not leave foals was that they had too much work to do before they were fully matured. Mr. H. Fisher stated that a certificate of soundness was recognised as a guarantee, and enhanced the value of a stallion, and would be still better if he had a certificate as a sure foal getter. Four years he thought was the best age to begin to travel a horse, and he should not serve more than 35 mares for the first season. Mr. Bice considered that the mares should be examined as well as the horse. It was almost impossible to get some mares in foal. Mr. Berriman said that no horse should be travelled under four years of age, and should not have more than 40 mares to serve. At five or six years the number could be increased to 60. Some assurance should be given to owners of mares that a reasonable number of foals would be left. He condemned the practice of some farmers who insured the mares that were hard to get in foal and not those that were easy. To be fair to the man travelling the horse they should all be insured or none at all. Mr. Robertson, in reply, thought the fairest arrangement to both parties would be for part of the fee to be paid at the time of service and the balance when the mare had foaled. This system was in vogue with some horseowners in this district, and appeared to give every satisfaction.

Davenport, June 19.

(Average annual rainfall, 9in. to 10in.)

PRESENT.—Messrs. Roberts (chair), Bothwell, Holdsworth, Gosden, Messenger, Lecky (Hon. Sec.), and one visitor.

THE DAIRY COW.—Mr. A. W. Gosden read a paper on this subject. The success of dairy-farming, he said, depended to a considerable extent on the class of cow kept. In the North this matter did not receive the attention which its importance warranted. The Shorthorn, which had a world-wide reputation for hardiness and adaptability to climatic conditions was the most suitable breed. The herd could be improved by the use of a Shorthorn bull of a strain of known milking qualities on the best of the cows. Continuing, the paper read—"A better cross would be the one favored by the Government expert a few years ago for the Jersey cow, namely, an Ayrshire bull. It was found that Ayrshire bulls on Shorthorn cows brought about a better milking constitution, more active cattle, and an improvement in udder formation. The crossbred Jersey is an unprofitable beast for the butcher, but the Shorthorn cross sells well. Too much importance cannot be given the selection of a bull. He should come from a good milking strain, and the farther back his pedigree favors him in this respect the better his progeny are likely to be. Many favor the Shorthorn bull for the dairy herd because the calves are of more value as vealers. This is important to most dairymen, as they only keep a few calves to take the place of the cows that are getting too old to be profitable. It is generally acknowledged that the fifth and sixth years of a cow's life are the most profitable, yet if fed well and looked after she should yield a good return at 10 years. Denmark has always been held up to the world as the model and most successful dairy-farming country, and one would think its success might be due to the strict attention paid to cleanliness. This is an important factor, yet the very careful selection of only the best of cows to be kept as milkers—not only the best class or breed, but the very best milking strain—with the stringent and careful method of feeding go a long way toward accounting for the very high standard of Danish milk. If dairymen of Australia cannot follow a prescribed method of feeding cows we should at least get a good class of Shorthorn. With these and a little attention in feeding we should make dairy-farming a much more profitable industry than it is at present."

Hawker, July 15

(Average annual rainfall, 12 22in.)

PRESENT.—Messrs. G. H. Wright (chair), J. Palin, B. Manson, C W. Pumpa, W J. Pumpa, and J Smith (Hon. Sec.).

CARE OF HARNESS.—In a paper under this heading, Mr. J. Pyman said that owing to the different systems of tanning now adopted, leather produced at present was not equal to that of some years ago ; consequently, every attention should be paid by the farmer to his harness. On no account should it be thrown down on the ground, but hung in a dry shed when not in use Twice a year, at least, it should be thoroughly washed and dressed with neatsfoot oil. A good dressing for black harness could be made from 2lbs. mutton suet and 3lbs. beeswax, melted over a slow fire ; 4lbs sugar, 2lbs. lamp black, 2lbs. soft soap, and ½lb. indigo powder. When the whole had been thoroughly mixed, ½gall. of oil of turps should be added. If the harness were brown the lamp black and indigo powder could be left out. Copper rivets had their place as a means of repairing harness, but it was a mistake to put these in some places where stitching was necessary. Collars should be well fitting, and it was essential to hang them up when not in use. While there was little danger of sore shoulders when a hard, well-fitting collar was used, if the lining became broken it should receive immediate attention. It was better to put a pad above and below a sore than to cut a hole in the collar, but when this had to be resorted to it was advisable to sew the lining so that the body of the collar was kept firm.

Hookina, July 15.

(Average annual rainfall, 12in.)

PRESENT.—Messrs D. Madigan (chair), B. Sheridan, J. Carn, P. and T. Kelly, F. Stone, H. Huddleston, P. Kelly, jun., P. Henschke, S. Stone (Hon. Sec.), and two visitors.

FODDER CONSERVATION.—Mr. P. Kelly read a short paper as follows :—" Farmers in this district should not burn their stubble, but rake it up as soon as possible after the crop is off. It should then be stacked until required. When green feed is plentiful they should cut the best of it, such as wild oats, and especially that which grows in watercourses. This carted in and placed layer upon layer with straw makes good fodder. If fodder were collected every year in this way sufficient for a dry spell would be secured. I believe that black rust is caused by burning stubble every year." Mr Carn would put salt and molasses with straw. Mr. Sheridan did not think black rust was caused by burning stubble. [In this regard Mr. D. McAlpine (Government Vegetable Pathologist of Victoria) says—" It is sometimes recommended to burn the stubble in order to destroy any spores of rust that may be about, but as a matter of experience this has not been found to produce any appreciable difference. Theoretically, the burning of the surface of the soil should destroy a number of the spores, and to that extent is beneficial ; but, practically, the difference in the result is not marked. As far as most wheat soils are concerned here, the loss of vegetable matter is much more serious than any possible increase of rust."—ED.] When straw was raked, Mr. T. Kelly said, too much dust was gathered with it. He preferred cutting it with the binder. The Chairman recommended chaffed straw with bran and pollard for feeding during dry spells.

Morchard, June 14.

(Average annual rainfall, 11in. to 12in.)

PRESENT.—Messrs. E. J. Kitto (chair), W. Toop, W. Reichstein, E. D. Kirkland, W. A. Toop, H. Kupke, H. A. Toop, B. S. McCallum (Hon. Sec.), and two visitors.

NOXIOUS WEEDS.—In a paper under this heading Mr. G. Parsons drew attention to the necessity for destroying the star thistle. This commenced growth early in the winter, and frequently was not noticeable until flowering. The seeds were readily carried by sheep and other animals, and the plants rapidly increased in number. The most satisfacotry way of destroying it was to cut with a hoe when it was budding. A practice he had adopted was to go over the plants with a scythe two or three times at different periods, chopping under those with a hoe that were too short to be cut with the scythe. If this were carried out annually it would be found that the weed would be kept well under control. However, it was practically useless for one farmer to attempt to clear his land whilst his neighbor neglected it. Mr. W. Reichstein said it was little encouragement for the farmer to cut star thistles when the Government road adjoining his land was thick with this weed. Special mention was made of the stock road between Orroroo and Morchard. Mr. Kupke thought the councils should enforce the provisions of the Noxious Weeds Act.

Mount Remarkable, July 22.

(Average annual rainfall, 14·43in.)

Present.—Messrs. N. S. Giles (chair), L. A. Bauer, E. B. Andrews, G. Casley, W. Foot, R. G. Fiebig, G. H. Goddard, J. McIntosh, W. Oldland, F. B. Smith, E. M. Willington, J. Welsh, G. Yates, jun., T. S. Bishop, and H. H. Davie (Hon. Sec.).

Dry Farming.—Mr. J. Welsh read the following paper:—"There is a lot in the cultivation and harrowing of fallow, especially after rain, to keep the moisture in. After rain it is also good to harrow the growing crop as it is just appearing. This conserves the moisture for the young plant by retarding evaporation. Opinions are divided, however, as to the wisdom of harrowing the growing crop. Ground must never be so wet as to be boggy for this work. After a good rain feed off the fallow, as the rain starts all the weeds and rubbish to germinate. This year on the plain we have had no chance to do seeding after rain, as we have had no rain; yet we have plenty of time for a good crop if good rains and favorable weather occur toward late spring. For dry farming the land must be worked to a very fine tilth, and the seed sown shallow. On no account must the surface be left rough. I do not use manure. The soil, being in the dry area, is still very rich. I use Federation, Marshall's No. 3, and Yandilla King wheats, and these yield well. On my land the fallow need be ploughed only 3in. Heavier land would need only 4in. or 5in. In good seasons I have ploughed stubble, or even cultivated it, and have got results equally good with those off fallow. I still broadcast the seed." Members agreed that when the ground was fairly crumbly after rain, harrowing the young crop was good, and promoted strong vitality.

Orroroo, June 14.

(Average annual rainfall, 13·42in.)

Present.—Messrs. J B. McDougall (chair), E. Turley, J. M. Cadzow, J. J. Dennis, K. McLean, L. R. Cotterell, R. C. Sharp, W. W. Collins, J. C. Hagger, J. R Chapman, T. H. Tapscott, H. Chapman, A. L. Brice (Hon. Sec.), and two visitors.

Fruit Culture.—In a paper dealing with the growing of fruit in the North on small holdings, Mr. Hagger said it was necessary to plough land intended for this purpose to a fair depth. The harrows should follow, and then holes about 3ft. in diameter should be sunk to a depth of about 15in. These should be refilled with surface soil worked to a mellow condition. Rows should be not less than 12ft. apart. Strong trees with good leaf and wood buds and strong roots should be selected. They should be kept from the sun and wind during planting, and placed in the ground about 6in. or 8in., the holes then being filled to within 2in. of the surface. Damaged roots should be cut away with a sharp knife. The soil should be firmly trodden, without injuring the roots. Pruning should be fairly hard for the first year, to give the tree a good main trunk about 12in. to 18in. high. Three or four main arms should be cut to healthy outside wood buds. These should be situated at different levels on the trunk, or there might be a danger of the tree splitting in later years. A windbreak of tamarisk, tagosaste, or a double row of almonds should be provided. Apricots, peaches, Japanese plums, Cleopatra and Rome Beauty apples, Williams Bon Chretien pear, and Washington Navel or St. Michael oranges were recommended. Oranges required a good deal of attention. For the first two or three seasons they needed protection from winds and frosts. This could be provided by supporting bagging on three or four stakes driven in a short distance from the trees. The chief protection was necessary on the south-west side; the north-east aspect could be open. Plenty of water was required during summer and autumn. With the second winter's pruning of deciduous trees it was advisable to shape the secondary arms. The objective was a tree with a strong base, shaped like a cup, and opened in the centre, in order that light might have access to all parts. The tree should not be high enough to necessitate the use of a ladder for picking, spraying, or pruning. Saws and secateurs should be kept sharp and clean. A spray of arsenate of lead should be applied when the fruit was about the size of a pea, and this should be followed by two or three sprayings at intervals of five or six weeks. Hessian bandages, 3in. or 4in. wide, should be put round the tree trunks, as traps for the codlin moth. The soil surrounding the trunks should be well worked. When the fruit was about half size the trees should receive a thorough watering. All dead wood should be cut out, and shoots should be evenly spaced and not crowded.

Quorn, July 19.

(Average annual rainfall, 13·78in.)

Present.—Messrs. R. Thompson (chair), Britza, Shulze, McColl, Jago, Bury, Brewster, Noll, Cook, and Patten (Hon. Sec.).

Ensilage.—The following paper was read by Mr. Thompson :—"Ensilage is fast changing the methods of feeding every class of livestock. Employed in the first instance as feed for dairy cows, its use has spread until no big sheep farm is complete without a silo. It has also formed part of the feed, during times of scarcity, for horses ; but in this connection it has less to recommend it than is the case with almost every other class of stock. It has the merit of containing properties which are most desirable in feed. Generally speaking it is cheap, palatable, succulent, and bulky, and these are recommendations of no mean order. One of its chief advantages has been the effect it has had on the increase of the milk supply during the summer months in every dairy where it has been used. Such a succulent article of feed as ensilage cannot fail to be infinitely more desirable than dry hay or chaff fed without bran. Three Victorian farmers have recently thus expressed themselves on the advantages which have accrued to them since making a general practice of feeding with ensilage during the dry months. The first says that the increase of production of his milk and cream in the first year has more than paid for the cost of erecting his silo. His cows have been milked quite as freely and have given as good fat contents as if they were on green grass. The second says that ensilage has saved fully half the cost of feeding during the dry months, and has reduced the consumption of hay by fully half. The third pronounces ensilage as excellent for his dairy cows at all times of the year. Regardless of the nature of the seasons he makes use of his ensilage in conjunction with any other feed that may be available, and he considers that his cows gain materially in milk yield, as the quantity is increased, which, to his way of thinking is about the best possible evidence of the manner in which cows will respond to the juicy contents of ensilage. Where considerable quantities of bran are fed, the substitution of an ensilage ration keeps down the bran bill in an appreciable manner. Up to a certain point, depending upon whether production is extremely heavy or not, the more ensilage a cow eats the less bran will it be necessary to feed during the summer months. Besides the cost of the feed being reduced, there is also a reduction in the cost of producing a given amount of butter-fat. Only 50 cub. ft. are required for a ton of ensilage, whilst for hay fully 10 times as much space is needed. It certainly costs much less to put together 50 tons of ensilage than the same amount of hay. Where careful statistics have been kept regarding the cost per ton, the result works out as follows :—Hay costs 6s. per ton, and ensilage 2s. 6d. But generally speaking the average cost can be put down at 3s. per ton. Reference to the work done on some of the experimental stations in America shows that over a period of eight years the silos were filled at the average cost of 3s. 1d. per ton. This included cutting in the open, hauling, cutting up, trampling down, levelling, and covering. Moreover, the cost per ton, including seed, preparation of the land, interest on the investment, cultivation, cutting, and filling is figured out at 6s. per ton. In other words, the whole process of growing and conserving ensilage costs no more per ton than that of gathering hay. The advantages of ensilage may be summed up as follows :—It will keep young stock thrifty and growing at all times of the year, and enable the cows to produce milk and butter more economically ; it will increase the proportion of the milk and butter-fat, is more easily handled than dry fodder, and uses up and preserves in a palatable form material which would not otherwise be eaten. More stock can be kept on a given number of acres, and it is the most economical method of supplying feed for stock during the hot, dry periods of summer, when the feed in the open is both short and scarce. Experience has gone to prove that when feeding sheep with ensilage during the summer months, or during a period of drought, the best result can be obtained by giving a certain amount, say one-third of the quantity, of good wheaten hay. Sheep do not thrive so well on a succulent ration as on a combination of the dry and the succulent. Another feature in favor of ensilage is that if the silo be thoroughly airtight, the contents do not deteriorate in palatability with age, though, of course, there is a limit in this respect. Some astonishing results have been obtained from ensilage 10 or 12 years old ; but it is the exception o find anybody who can succeed in keeping either their pits or their silos securely locked up for such a time. Anybody who has the good fortune to look back 10 or 12 years without having to reckon two or three uncommonly dry summers in that period must consider himself fortunate." Mr. Noll had a stack of ensilage about five years old. Members generally agreed as to the wisdom of storing fodder in seasons of plenty

Tarcowie, July 15.

PRESENT.—Messrs. F. Sanders (chair), J. Brewer, A. Shrowder, M. McCarthy, J. Symons, D. Butterick, J. Dempster, W. Travers, C. Horlin, J. Burgess, T Ninnis, A. Dempster, and M. Murphy (Hon. Sec.).

FEEDING FOR MILK PRODUCTION AND MILKING.—In discussing the relative values of hay chaff and bran and cocky chaff and bran for feeding to dairy cows, Mr. T. Ninnis said his experience was that the latter produced a greater flow of milk, whilst the milk from cows fed on the former was richer in butter-fat content, but the bulk yielded was less. Although the balance of opinion was in favor of " clean stripping " when milking, Mr Symons held that the animal remained in milk longer if this were not done. Whilst the majority of members believed in milking the two fore, and then the two hind teats, others advised milking the off front and near hind, and then the near front and off hind.

Wepowie, July 18.

(Average annual rainfall, 13in. to 14in.)

PRESENT.—Messrs. C. Halliday (chair), C. Knauerhase, . E. and C. Pearce, G. Roocke, J. Crocker, T. F. Orrock (Hon. Sec.), and one visitor.

WATER SUPPLY.—In a paper on this subject Mr. T. E. Pearce said that where good holding ground was available a useful supply of water could be secured by constructing a dam, say, 40yds. x 30yds., x 10ft. deep, which would cost about £40. It could be taken out in four weeks if two teams were put on. Wells, however, were preferable, and where possible the services of an experienced wellsinker should be secured. The divining rod could be used to locate the supply and, if possible, the well should be sunk where the underground streams crossed. The use of a boring plant was advisable in rocky country, as the cost was less than that of manual labor. Mr. Roocke did not think the divining rod of service in locating underground springs, but other members thought it a splendid thing.

Willowie, June 18.

(Average annual rainfall, 11·90in.)

PRESENT.—Messrs. T. Hawke (chair), D McCallum, B. E. Schmidt, S. C. Greig, E. S. Bristow, S. Tucker, A. Gray, F. Richter, L. Hughes, W. P. Foulis (Hon. Sec.), and one visitor.

FARM MANAGEMENT.—Mr. T. Hawke read a paper, as follows :—" To the inexperienced, the notion that to manage a farm successfully necessitates any considerable possession of business acumen may seem a somewhat humorous proposition. It is astonishingly easy to demonstrate by figures how rapidly one may accumulate money by wheat-growing and other farming operations. Unfortunately, all who have had an intimate acquaintance with the practice of farming know that all theories and calculations are subject to considerable modifications and qualifications, and that the practice does not always work out in conformity with the theory. It is just here that the necessity for good management on sound business lines becomes evident. If it were possible to say with certainty that by fulfilling specific conditions definite results would follow, that is to say, if we could be sure that by adopting a certain form of cultivation, and using a given quantity of seed and manure, it were possible to accurately foretell the resulting harvest, there would be but little need for careful business management, and any man with health and strength, and sufficient capital to get a start on land, could confidently anticipate continued success. Observation, however, has shown that often where two men work on similar farms with similar opportunities and under similar conditions, one will fail while the other will succeed.

The difference has been mainly in the management. This has been very plainly demonstrated on Eyre's Peninsula during the past two years. Many new men, some young and some older, have ventured on the land in the confident hope of big returns, and not having had farming experience, and knowing but little, except in theory, of the thousand and one difficulties that they might expect to confront, have launched out in all directions and loaded themselves with liabilities, which, when the crops proved a partial failure, crushed them. However, throughout that great district are many who have worked under similar conditions and each year have consolidated their estates and improved their financial position. This subject is too bulky to treat in detail; so many avenues of thought are opened up when one thinks of all the departments of farm life where good management is essential, but I will try to indicate briefly some directions in which good management stands for success where the opposite would tend to failure. There are well-defined rules relating to farming that do not permit of any difference of opinion, such as, for example, the necessity for fallowing, the wisdom of conserving fodder for stock, the desirability of good sound fences, the need for up-to-date labor-saving implements, and the practicability of combining other side lines, such as sheep, dairying, and poultry, with wheat-growing. Then there are such things as the farm workshop, where simple iron, wood, and leather work may be done; and, again, the farm garden, where fruit and vegetables may be produced for use on the farm. But it is in the arrangement and carrying out of the various operations mentioned that the need for management occurs, and the one word that more nearly than any other sums up the position is—system. In farming, as in other callings, the absolute necessity exists for placing things in their true relative positions. First things must come first if success is to be achieved. The farmer who forgets that the main essential to success is fallowing, and who neglects this most important work to do a few little jobs about his workshop and thereby save a few shillings or even pounds in tradesmen's bills, is practising a false economy, and his management is faulty. That which applies to fallowing applies with equal force to all the other operations connected with wheat-growing. A good manager will not neglect to cultivate his land in the spring when the opportunity offers to kill rubbish for the sake of working his fruit garden, however much his inclinations may lean towards the latter. There are but 52 weeks in the year, and if all the side lines are to be touched upon and worked for profit, it means that a good deal of solid thought must be expended in order to prevent the less important work encroaching upon the time that should be occupied by the work that is more or most important. Then in regard to machinery and implements there is scope for plenty of foresight. How many farmers have purchased machines that appear right in theory, only to find that they became obsolete within a year or two, when something else had to be bought to do the work. As for conserving stock fodder, there is but one time when this work should be done, and that is whenever the food is available for conservation, and it is practicable to postpone other work. Only in this as in all else the good manager will evidence his personality by putting the fodder away in such form that it will be well protected from the weather, and can be opened up in good condition when required." Mr. B. E. Schmidt also read a paper on this subject. Carefulness in the matter of farm management, he said, was an essential; neglect meant the loss of both money and time. The homestead should be well and comfortably built. Stone walls should not be less than 10ft. in height, and iron walls 12ft.; a flat roof should on no account be put on. The horse stock should be well fed. Implements light of draught and up-to-date in every particular should be secured. Harness should be oiled at least once a year. A workshop, where small repairs could be effected, was indispensable. The person who intended commencing farming was recommended to gain some practical experience before he invested his capital, as there were frequently innumerable difficulties which did not meet the eye of the inexperienced man. In the discussion which followed, Mr. E. S. Bristow said pug walls involved too much labor in erection. Sparrows got into straw roofs, and the wind moved the straw so that in wet weather frequently they leaked. Galvanized iron was best for both the walls and the roofs of stables and sheds It was necessary to oil harness three times a year. Mr. Tucker thought the most serviceable shed was constructed of pug walls with an iron roof. Iron walls soon became damaged, and limestone was difficult to procure on the plains; this prevented the use of concrete. Mr. McCallum erected a pug wall shed many years ago, and it was still standing He made the pug around the site, and trampled it with horses. Vehicles kept in sheds with pug or stone walls did not require tiring so frequently as those kept in open or iron-walled sheds. The destruction of oats was becoming a serious matter in this district, on account of the number of seasons that had opened late. Mr. A. Gray considered concrete the best material for walls. Skilled labor was not required. The concrete was simply placed between boards bolted together in the shap of the required wall. Harness should be oiled regularly; and care should be taken when purchasing neatsfoot oil, to see that it was pure All sweat should be removed from the harness before the oil was applied to it. Mr. S. C. Greig thought neatsfoot oil caused the stitches in harness to rot. He used a mixture of mutton fat and neatsfoot oil. Mr. Hawke used a mixture of mutton fat, oil, and resin. Mr. B. E. Schmidt thought mutton fat collected dust.

Willowie, July 15.

(Average annual rainfall, 11·90in.)

PRESENT.—Messrs. T. Hawke (Chairman), D. McCallum, S. C. Greig, E. S. Bristow, S. Tucker, L. Hughes. A. Gray, A. R. Wilkin, E. J. Kentish, A. and J. Stone, W. P. Foulis (Hon. Sec.), and four visitors.

WEATHER FORECASTS.—Mr. E. J. Kentish contributed a lengthy paper on long distance weather predictions. Members were divided in opinion as to whether reliance could be placed on these forecasts, and as to the likelihood of the development of the science in future years. [We regret that we are unable to print this paper.—ED.]

Wirrabara, July 19.

(Average annual rainfall, 18·91in.)

PRESENT.—Messrs. J. Hollett (chair), E. J. Stevens, J. Fitzgerald, W. Bowman, C. F. H. Borgas, E. Pitman, P. Lawson, P. J. Curnow, H. Francis, C. Hollett, W Marner, E. Kavanagh, C. Hollett, W. H. Stevens, R. Curtiss, L. S. Cobiac, P. R. Hoskins, L. G. Dansie, A. R. Woodlands (Hon. Sec.), and two visitors

PLANNING THE FARM WORK.—Under the title "Systematic Farming," Mr. P. R. Hoskins read a paper in which he advised farmers and gardeners to plan out their work so that if it were found that they were getting behind with it, some of the less important duties could be left. He advised the following system as suitable for this district :—"At the beginning of January we should have the harvest and most of the wheat-carting completed, but possibly the latter may run into February. This finished, we can pay attention to such things as building stacks of straw in the paddocks for fodder and shelter for the stock, covering sheds and catching up odd jobs that have fallen in arrears during harvest time. In March we should clean the seed wheat, and, it advisable, pickle it at the same time ; it will then be ready for the field. Then there were stone-picking, cleaning the stable of manure, superphosphate-carting from railway, getting drills in order, harness oiled and mended, in readiness to start tilling the second week in April. By the end of April seeding should be in full swing, and with a drill doing 10 acres a day or 50 acres a week, this should be completed by the end of May. Drills should be well overhauled before being put away into the shed. Farmers should pay particular attention to cleaning out the super. box and give it a good brushing over with kerosine. During June, fence and clear land and get all necessary things ready for fallowing. Fallow during July and August. To finish fallowing by the end of August with an eight-horse team and a five-furrow plough will mean something like 35 acres a week for eight and a half weeks, which just cuts out the two months allotted. In September harrowing and cultivating should be done. In October shearing needs attention ; hay frames, binders, and harness should be got ready for hay-making. In November hay-cutting, stooking, and carting require attention, and possibly reaping. By December harvest is in full swing. It will be seen, when this plan is followed, that the horses are at work in January and February, then they have a spell. They are then engaged six weeks in seeding, are spelling during June, fallowing in July and August, spelling again during September and October, and should be in good condition to commence harvesting." Members generally approved of the suggested scheme, but thought modifications to suit weather conditions necessary

SYDNEY GRASS.—In reply to an inquiry as to the best method of destroying this grass, Mr P. J. Curnow said that on land that could be left idle for a number of years, arsenical scrub exterminators would be found effective. The Hon. Secretary thought these should not be used on account of their dangerous properties. For a small patch, covering for a time with galvanized iron would be found effective, but continual digging was advised for a larger area.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Booleroo Centre, July 11.

(Average annual rainfall, 15·83in.)

Present.—Messrs. W. Mitchell (chair), R. W. Stanton, R. Burrie, B. Reichstein, G. R. Hein, N. L. Brooks, W. H. Berrill, H. W. Kahl, W. H. Sanders, J. Carey, sen., J. M. Carey, J. and B. Kerr, H. C. Jaeschke, J. H. and J. Pepper, G. Ashby, W. H. Nottle, sen., W. Whibley, L. Fry, O. E. W. Bruns (Hon. Sec.).

Farm Horses.—In a paper dealing with the most suitable stamp of horse for the farm, Mr. H. C. Jaeschke said that in light sandy soil the walking was very heavy for a heavy horse, consequently one of a lighter stamp was preferable. In loamy soil, where the draught was greater, the heavier animal was better. For local conditions, as the land varied considerably he recommended the Clydesdales. However, the most important factor was attention to feeding and cleaning. Mr. W. H. Sanders also read a paper. When breeding horses, he said, the farmer should pay careful attention to the selection of the stallion and the mares. The former should be sound, compact, active, and of good temper. The unsound horse would be found to slacken in his work and bring the whole team back. Early foals were preferable, as they got a good start on the green feed. Good feed from the time of birth was of utmost importance. Horses should be worked in well-fitting collars. Rock salt should always be kept in the mangers. Members generally thought the horses in the district were of a good stamp.

Canowie Belt, July 15.

(Average annual rainfall, 20·04in.)

Present.—Messrs. E. T. Daly (chair), A. F. Dempsey, G. Kirk, R. Carter, H. A. Wedding, A. Noll, A. Sanderson, H. Schultz, F. J. Schultz, A. Spavin, J. Sparks, A. Kitschke, S. Crouch, C. O'Mahoney, E. W. Noll, C. J. Wedding, F. D. D. Stapley (Hon. Sec.), and two visitors.

Farm Management.—A comprehensive paper on this subject was contributed by one of the members. The first essential on the farm was a good fence, he said. A substantial six-wire fence, with two split gum posts and four tee iron droppers to the chain could be erected for about £35 per mile. He used the Donald wire strainer and kept the wires reasonably tight. This held the posts in line and doubled the life of the fence. Speaking of implements, there was a large variety of cultivators on the market, but nevertheless he thought the cultivator was the most imperfect implement on the farm. The use of the Λ cultivator was most common, both in set and stump-jump implements, and they tilled the land well, giving the least trouble to team and driver. The drawback was that they invariably bunched the soil in the centre of each cut, forming what was known as a crown, leaving only a light cut of loose soil on each wing. This undesirable class of work became intensified at each operation, until it caused even the plough to cut perhaps 2in. deeper at one time than at another; also when drilling, the seed was put in too deep in the crowns and scarcely covered in the wings. This caused irregular germination, and left both land and crop open to many hardships, especially on hillsides, where watercourses were formed by the ridging of the land. The zigzag shape of cultivator did not crown its land, but it left a number of unsightly open ridges in each cut, destroying all the principles of moisture conservation, and must prove disastrous on hillsides should a heavy fall of rain arrive before the land had been harrowed or levelled. The "one way disc" and the skim plough or cultivator, if skilfully driven, left a perfect seed bed, but they were cumbersome and difficult to handle, turning the soil all one way; they had to be worked around a land which was a disadvantage when cultivating in front of the drill. There was a challenge to implement makers to overcome the bunching of the soil by the Λ cultivator. The harrow was a very important implement. It was a mistake to have harrows made of heavy iron. Their own weight often broke the bulls and dulled the points. They should be made of mild steel bars, ⅜in. by 1in.; tines ½in. square, with points tempered hard. Harrow tines were usually pointed with one heat and then thrown down to cool. This made a very soft point, and a few days' work on hard, gritty land wore the points up to a blunt end. The land roller should be used much more frequently, especially in dry seasons; it consolidated the soil, giving the young plant a chance to fix its roots. A clod was more objectionable than a stone, because it absorbed moisture from the surrounding soil, but returned none, whereas the stone neither gave nor took moisture. He would use the roller then, if necessary, to obtain a firm seed bed. With the binder the effort to turn out very large sheaves overtaxed it, with the result that the tying parts were worn out while other parts were still as good as new. There was a great waste of hay in cutting 2in. to 3in. and even 4in. higher than necessary. A roller or leveller should be put over the land so that harvesting machinery might do its work properly and with safety. "Making hay while the sun shines" did not mean that cutting and stooking must be completed in the same hour. He would give it at least half a day's sun to wilt before stooking. The complete harvester was a great labor saver, and gathered the grain expeditiously, but it required careful handling or it would waste more than it saved The driver should be a man with presence of mind, and he needed a strong steady team of horses. Five good farm horses were necessary to keep a harvester travelling the regular pace for a season. The chaffcutter very soon saved its cost in the food value obtained in place of long hay, and the waste was reduced to a minimum. The seed grader was a machine that very few paid much attention to. Farmers were too careless and indifferent about seed wheat. They should carefully remove the seeds of all undesirable plants and aim at obtaining seed of the very best quality. The writer concluded by recommending farmers to drill seed in 3in. deep in dry seasons, particularly on well-worked fallow. The protection of implements, machinery, and harness from the effects of weather and from undue wear owing to neglect was urged as an essential part of the good management of the farm.

Breeding and Feeding Pigs.—A paper on this subject was also contributed. The writer favored the Berkshire-Poland cross, both for market and use on the farm. Sows must be kept in good condition, especially during the two months preceding farrowing. Plenty of clean slop feed, but not too thin, was recommended. It was doubtful whether pigs paid without milk in their ration, but it should not be given warm from the separator. For three-months-old pigs a little pollard should be mixed in the milk. For the first eight weeks they should be left with the sow, and she should be fed three times a day. Wheat or barley soaked in milk was to be recommended for the sow. He had yards for the pigs, but it did not pay to let them have a big run. He had sold eight-week-old pigs at £1 per head. When killing, he shot the pigs and then stuck them. They bled well and there was no struggling. The water for dipping should be ½gall. cold water to 4galls. boiling. If too big to dip, boiling water could be poured over the carcass. He added a handful of washing soda to a copperful of water. A big pig should be killed in the forenoon and left to hang until the next morning.

Gladstone, July 19.

(Average annual rainfall, 16in.)

Present.—Messrs. R. E. Lines (chair), R. Peters, A. Blesing, J. Eley, J. Sargent, W. Brayley, A. Anderson, F. Aughey, T. Mutter, F. Mutter, J. Fisher, W. L. Evans, H. Fay, J. Coe, R. Coe, G. Fisher, R. A. Humphris, J. Page, A. E. Dinning (Hon. Sec.), and two visitors.

Farm Implements.—Mr. W. L. Evans read a paper on this subject. All machinery with woodwork, he said, should be under cover for nine months of the year. Wood and iron sheds would be found most satisfactory, and these could be whitewashed with the following preparation :- -Fifty pounds of lime, over which boiling water should be poured, and then the following ingredients added, 25lbs. whiting, 5lbs. plaster of Paris, 3lbs. sugar, 2lbs. salt, 1lb. blue, ½pt. boiled oil. Continuing, the paper read —"It is well to keep all stock away from the shed, for they are apt to do damage or be injured. It is to be deplored that so many people allow poultry to roost on their vehicles and machinery, for nothing can be more horrible than to have to handle things on which poultry droppings abound, to say nothing of the lice that gets on one's clothes and body. A good plan is to sew together sufficient bags to cover each machine not in every day use. See that each machine is put in its place as soon as it is done with, but before doing so it is well to go round it and make a note of any parts needing repairs and fittings that are needed before it can be used again. See if any bolts are loose or lost, and so on. Having made note of everything, fasten it to the machine. This practice will save considerable time later on, and if the machine has to go to the smith for repairs, one can be fairly sure that nothing is missed. If this is left till the next season, important repairs will probably be forgotten. It is advisable in spare time to clean round all wearing parts and see that oil holes are free. Bearings may be broken unknown to the owner, with the result that accumulations of dirt and grease around the broken bearing end in the shafting being cut to pieces.

Go over every bolt and see that it is screwed tight. Paint such machines as binders, drills, or harvesters every two or three years. Wagons and drays especially should be painted, they being more often out in all weathers. Iron implements, perhaps, do not need cover, but they are all the better for a coat of paint occasionally to prevent rusting. In buying new implements or machines, every man will be guided by his own experience or fancy. We find one man swearing by a certain make of machine, and the next neighbor by another make, both claiming that their machine is best, and maybe it is, according to conditions and usage. In considering the various points in favor of any machine, one should always take into account the accessibility of each part. I have often spent an hour or more in trying to get at some part needing repair, while the actual job has only taken 10 minutes to do. Too much care cannot be taken of vehicles. The axles should always be kept well greased or oiled and properly washered up. If that were done their life would be considerably lengthened. Patent axles are more likely to have the washering neglected, as one has only to take off the cap and fill the reservoir with oil, and no thought is given to the back washers. Often have I seen vehicles taken into the shop with the axles either shining like mirrors or covered with dry, black powder, both denoting want of lubrication. Under those conditions the axle wears badly, the washers go, and there is a lot of play between axle and box, and this in turn has a very detrimental effect upon the wheels, especially those known as sarven. If the tires are at all loose, they should be cut and shut as soon as possible, otherwise the wheels will get out of repair." The following is also extracted :—" Many members advocate having a forge and accessories for farm use, and no doubt they are useful at times. But I think you will agree with me that the man who can handle all the tools recommended in some papers would have but little time to till his land and care for his stock. Nevertheless it is well to have a few tools about the place in case of emergency ; but only temporary repairs should be effected, leaving the proper fixing up for the tradesman. Such things as S hooks and eyebolts can be made at home. They are done for cheapness, but would farmers take from a tradesman the same class of work that they turn out at home ? I fear not. If they would they could probably get them at half the present cost. By all means have a forge and anvil and a few other tools, and take care of them. My experience is that on farms tools are left about just where they are used last. Good saws in damp places, planes likewise, a brace here, and bits in some other place. This sort of thing goes to show that the farmer has not time to handle tools properly, and therefore the purchase of expensive tools is only a waste of money." Members were divided in opinion as to the advisableness of the farmer's son spending 12 months in a blacksmith's shop. Mr. Brayley urged farmers to carefully note any repairs necessary to their implements at the end of the season. He preferred neatsfoot oil for use on binders. Mr. Eley recommended castor oil for screwing, and separator oil for other purposes.

Georgetown, July 19.

(Average annual rainfall, 18·32in.)

Present.—Messrs. J. Myatt (chair), A. Smallacombe, E. Hewitt, J. Buchan, M. J. McAuley, M. B Saunders, A. Erickson, and S. Eyre (Hon. Sec.).

Sheep on the Farm.—In a short paper on this subject, Mr. A. Smallacombe said that although this district was an ideal one for wheat-growing, the farmer was well advised to keep sheep. Not only would these provide him with his meat supply, but the assistance they rendered in clearing the fallow was of the utmost importance. They should be put on immediately the weeds appeared, and kept there until the cultivator was put over the land. Merinos were generally favored, but the higher lambing percentage secured from crossbred ewes, and the fact that the lambs of the latter matured earlier, weighed heavily in their favor. The value of the fleece, lambs, and general hardiness of sheep made them most preferable for the farmer. Members generally thought the lamb trade of little use to farmers unless they were situated in favored spots. The Merino was preferred for the farm.

Julia, June 19.

(Average annual rainfall, 18in. to 19in.)

Present.—Messrs. T. Prior (chair), C. Nash, A. Pfitzner, W. Hall, B. J. Schmidt, W. Thiele, G. Gaerth, J. T. Freeman, E. Richards, T. Brown, T. Neylon, and W H. Neal (Hon. Sec.).

Fallowing.—Mr. W. Hall read a paper on fallowing. "Fallowing should be started as soon after seeding as possible," he said. "It is not a good practice to give the team a fortnight or three weeks' spell, as a few weeks dry weather would throw back the work. In my opinion a much better return may be secured from early fallow than from late. The ground should be ploughed 4in. or 5in. deep if it will stand it. Clay is, of course, much better left where it is. Harrow as soon as possible after ploughing, as after it has been exposed to the air for only a few days the soil has a tendency to crumble, and it does not take so much labor to get it into a fine condition as it would if left lying a while. If left, there may be a lot of rain and the soil may get baked down so hard that harrowing will do very little good. I do not think it advisable to commence cultivating very early in the season, or there may be a great deal of rubbish to kill afterwards.' Sheep will see that not much goes to seed. After cultivating, leave the fallow until after rain and then harrow again. I do not think one can harrow the fallow too much after rain in this district." Mr. Prior thought it a good plan when fallowing to stir up the subsoil with a hook, but care must be taken not to turn it on top. In one instance he ploughed very deeply and the subsoil crust was broken. On this piece of land he had a much better crop than from other parts of the farm. Mr. Thiele thought it better to leave fallow lying open a month before harrowing.

North Booborowie, July 16.

(Average annual rainfall, 16·35in.)

Present.—Messrs. W. B. Ashby (chair), W. R. Birt, M. Canny, L. D. Clark, W. E. Hannaford, P. McColive, E. J. Morgan, F. L. Phillips, K. Phillips, J. W. Smart, A. S. Tall, W. C. Warner, and A. V. Simpson (Hon Sec.).

Fencing.—A paper, as follows, was read by Mr. L. D. Clark :—"It is well to bear in mind that a good fence really costs little more than a bad one. Some fences one sees are veritable traps for stock, and many valuable animals are ruined through getting entangled in barbed wire loosely hung on the posts. Then, again, bad fences are often the cause of ill feeling among neighbors. Where sheep are kept it is advisable to put in five plain wires with one barb (12 gauge) on top. No 8 black iron wire will be found the best, as it is not so apt to break as galvanized or steel wire. The strainers should not be more than seven chains apart, as where there is a long strain it is difficult to keep the wires tight. One wooden post should be put in every chain, and five T iron posts between the wooden. The former should be 5ft. 4in. long, and put in the ground 20in., leaving posts 3ft. 8in. high; 4ft. 6in. will be long enough for iron posts. Strainers should be in the ground about 3ft., and 4ft. high, and those at angles and at the end of the line should be well strutted. The first wire should be 6in. from the ground, second 1ft., third 1ft. 7in., fourth 2ft. 3in., fifth 2ft. 11in., and top wire 3ft. 8in. First put up the strainers and wooden posts and bore them, and then run out the barb wire. Strain and fasten it to the wooden posts, which are to be bored 2in. from the top for that purpose. The iron posts can then be driven in and the barb wire fastened on with No. 12 wire. The plain wire is then run in, for which a jenny or reel is used." The writer then described the method of making a jenny. Mr. Hannaford preferred a fence as follows:—Five bottom wires No. 8 gauge, with top wire of No. 12 barb, spaced as follows from the ground—Bottom wire 6in., next 6in. higher, third 6in. higher, fourth 6in. higher, fifth 7in. higher, and barb 9in. higher, making the height of the fence 3ft. 4in. Strainers from nine to10 chains apart, 3ft. in ground, and standing 2in. over barb (thus requiring to be 6ft. 6in. long), strutted at the angles with good long struts sawn square at head and carefully fitted into the strainer between the third and fourth wires, the other end being beamed on a stone solidly rammed into the ground. Posts 60ft. apart sunk from 20in. to 23in. in ground, five flat iron standards between posts. Mr. Morgan did not think Mr. Clark's method of putting the barb on first a good one. He pulled the bottom wire through the posts first to align the droppers, and put the barb on last. Differences of opinion were expressed regarding the spacing of the bottom wires. Mr. Birks thought it should be 4in from the ground, there then being a space of 5in. to the second wire and 6in. to the third, in order to keep in crossbred sheep and their lambs. Mr. Ashby was of opinion that the fence described by Mr. Clark was suitable for Merinos, but British breeds of sheep should be kept in specially netted paddocks.

Port Broughton, July 25.

(Average annual rainfall, 14·44in.)

Present.—Messrs G Pattingale (chair), W. Whittaker, T. Pattingale, J. Hoar, E. Allchurch, G. Routley, and J. H. Fletcher (Hon. Sec.).

Breeding and Management of Cows.—The Hon. Secretary presented a comprehensive report of a lecture given by Mr. P. H. Suter, Government Dairy Expert, at the Pine Forest annual meeting on August 15th In the discussion which followed, the Chairman said that his experience had proved the bull to be more than half the herd. The main trouble with bulls was that they would go over the fences to neighbors' stock. Mongrels were not such bad fencers, and this fact accounted to some degree for the few good bulls kept. Mr. Whittaker thought much could be done by co-operation to secure first-class bulls.

Port Germein, July 19.

(Average annual rainfall, 12·84in.)

Present.—Messrs. Hacket (chair), Carmichael, Head, Deer, Stone, Pearce, Teasdale, Crittenden, Holman, Glasson, and Stewart (Hon. Sec.).

Conservation of Fodder.—Mr. F. Glasson read a paper on this subject. He urged the need of providing in years of plenty for less bountiful seasons. Hay should be thatched to prevent waste, and should be taken out of the stack clean to the ground, not allowing quantities to be destroyed round the stack. He would bind some of the crop and put it through the header, chaffing the straw with hay for stock. Cocky chaff and straw should also be saved for bad times. Members agreed generally, but were divided in opinion as to value of headed or thrashed straw.

Comparison of Seasons.—Mr. A. Carmichael gave some interesting statistics of rainfalls in past years, and said that some of these had convinced him of the need to conserve a good quantity of feed. The year most nearly comparable with this was 1886; the figures are given below—

	Rainfall, 1886.	Rainfall. 1913.
January	nil	nil
February	0·10	0·50
March	nil	0·64
April	0·50	0·02
May	1·25	1·00
June	nil	0·47
July	0·85	0·46
Total for seven months	2·70	To date (19/7/13) 3·09

Mr. Carmichael's paper concluded—"Thus we still have a chance, should good rains fall shortly, to have plenty of feed and a good harvest if we can only have patience to wait. I do not agree with those who say, whatever rain falls it can do no good."

Port Pirie, July 5.

(Average annual rainfall, 13·21in.)

Present.—Messrs. J. Greig (chair), W. Munday, H. G Hawkins, C. E. Birks, T. G. Kirchner, W. R. Wright, E. J. Eagle, E J. Hector, F. Johns, D. L. McEwin, and A M. Lawrie (Hon. Sec.)

Cost of Farming in Pirie District.—Mr. H. G Hawkins read a paper as follows:—"I will take a farm of about 800 acres, and assume that it is an improved one. The improvements should include a well-built house suited to the needs of the size of the family. The homestead should be near the centre, with a good water supply. All outbuildings should be built of stone, if procurable, and roofed with iron. There should be a stable for 12 horses, with two loose boxes for light horses, chaff shed, and engine-room attached, and a good stock yard and crush pen erected with post and rails about 6ft. high. A hay yard on the opposite side of the stable, or at the back of it, and a good hay shed close to the cutter will be found a great convenience. There should be a small cow yard with shed and bails not too far from the house. An implement shed large enough to hold all the farm plant, and a sparrow-proof trap shed. The barn should be very carefully built, mice-proof, with the floor about the height of the bottom of the wagon. A man's room, blacksmith shop, fowl run and sheds, and pigstye are required. The farm should be well fenced with six wires, and divided into convenient paddocks of about 100 acres in size. All should be divided from the homestead by good strong gates. The above may be called model improvements. The working plant is the real essential. Where it is proposed to crop about 350 acres and to fallow 350 acres each year, 12 good draught horses will be required, which will on an average cost £35 each, and two light horses

£20 each, the total outlay for horseflesh being £460. In addition, a six-furrow plough (£38), 15-tine cultivator (£32), 15-hoe drill (£42), set of six harrows (£12), binder (£38), two harvesters (£170), wagon and frame (£70), heavy tip dray (£25), spring dray (£18), trap (£40), horse rake (£10), grader (£25), chaff-cutting plant (£140), wagon harness, consisting of six spiders and two saddles (£12 10s), 12 sets of harness (£24), plough chains and swings (£8), set of trap harness (£8), spring dray harness (£6), riding bridle and saddle (£5 10s.), and tools for blacksmith shop (£20), will be required. Two milking cows will supply milk and butter for the house, these will cost £12 ; 50 fowls, £3 10s. ; and two pigs, £1 10s. If the farm is situated in a fairly good feed district, and only two or three foals are reared per year to keep up the number of working horses, also only a few young cattle kept, a fair amount of feed will be available, and I advise keeping as many sheep as possible, say about 150, which will cost £85. The total outlay is thus £1,070, including £70 for furniture. It will be necessary to take into consideration the first year's hay supply, &c. Forty tons will cost £100 ; 110 bags of seed wheat, £55 ; 9 tons of super.. £38 ; council rates, water rates, and land tax will involve £35 ; repairs to fences, &c.. £20 ; breakages and small items such as bluestone, £10 ; wages for one man for 12 months will amount to £70, and his keep £25 ; with living expenses for the farmer's family for 12 months, say, £100 ; for 1,500 new bags, binder twine, sewing twine, oil, £58 will be needed—making a total outlay of £511. The farm will cost at least £5,000, and interest on this amount at 5 per cent. will equal £250, and interest on the £1,070 invested in plant, £53, a total of £303, with the £511 expenses, making a grand total of £814. For 1,500 bags of wheat at 10s. per bag, £750 will be received, and for wool £40 in addition to £10 from other sources, making a total income of £800, or £14 below the outgoings, and no account taken of depreciation of plant, &c. The above estimate is based on the first year's working, the plant purchased being new, and a 15bush. average harvest being assumed. The cost for hay, &c., would not be quite so much when grown by the farmer, but it could be sold at market rates if not kept for use. Such an outlay is not necessary for the first year's operations Portions of the requirements could be acquired gradually, and might be bought for less second hand, but the repairs, &c., would be higher, and these would need to be replaced much sooner." Mr. Munday thought that Mr. Hawkin's paper dealt with a rather up-to-date farm, and that money at the present time could be far better invested in other ways. He agreed with the estimated cost of plant and working of farm. Farming was not so profitable as some people thought. Mr. McEwin also agreed. If anything, Mr. Hawkins estimated too little for harness. Mr Birks thought that if less land were cropped each year, and a few more stock kept the income would be as large or probably larger. He did not believe that farming was as bright as some people thought.

Redhill, July 15.

(Average annual rainfall, 16·79in.)

PRESENT.—Messrs. J. A. McAvaney (chair), Cox, Coffey, Lines, Potts, E. and B. Steele, Button, Pengilly, Kelly, Campbell, F. and F. A. Wheaton (Hon. Sec), and two visitors.

FENCING.—Mr. Lines read a paper on this subject. As gum posts would be expensive in this district, he recommended for a ring fence the use of myall posts, costing about 1s. each on the farm if not too distant from the railway, and three tee iron posts in between, the distance apart being 9ft. He would have two barbs, the top one being heavy and the next rather lighter, and would make the fence rabbit-proof from the start. The bottom wire might be 6in. from the ground, to allow plenty of space for drifting soil. The top wire should be strained up first. A good discussion followed. Some members preferred all irons, others five to seven irons between the wood posts, while the general opinion was that a wood post should be placed at regular intervals outside the fence and fastened to an iron. Mr. F. Wheaton considered it best to have two barbs, but the second barb he would place as the third wire down. Mr. Coffey would have a uniform type of fence all over the farm to facilitate valuation.

FARM MANAGEMENT.—Mr. B. Steele read a paper on this subject, and at the outset said that the appearance of the farm was an indication of the owner's management generally. Loose hay around the stacks should be raked up to avoid waste. In building a stable it was important to divide it into 5ft. stalls, so that every horse would get his share of feed. Horses in work should be cleaned down every morning and again at the dinner hour. They were then less liable to sore shoulders. It was a mistake to connect too many buildings, because of the risk of loss in case of fire. Fences would be less damaged if the land were not cultivated within 3ft. This was particularly important where a large number of iron standards and droppers were used. In throwing out the furrow when fallowing, it was a mistake to work the same way each year. If the start were reversed every year, instead of having hollows, the land would remain level, and at hay time a much more even cut could be obtained by the binder from the headlands. In discussing the paper, some members considered it unnecessary to allow as much as 5ft. for each horse in the stable. Others thought it necessary to plough as near to the fence as possible, to keep down the weeds. Mr. Lines preferred a two-storied stable, and the Hon. Secretary considered that a fowl-yard should be properly fenced off to prevent the poultry from travelling all over the farm buildings.

Spalding, June 20.

(Average annual rainfall, 20·25in.)

PRESENT.—Messrs. E. E. Gill (chair), D. J. Campbell, D. Shane, D. J. McAskill, G. Thorn, T. J. Preiss, J. Preiss, F. G. Saunders, H. Heithersay, S. Hennessy, J. Marron, P. Kelly, and D. A. Campbell (Hon. Sec.).

TREE CULTURE.—Mr. E. E. Gill read the following paper —" In presenting this paper on afforestation I would like to point out the great value of trees on a farm, first as a breakwind for the homestead and garden, second as a shelter for stock against hot and cold winds and the sun in summer, third as a supply for fencing and firewood, and fourth as an improvement in the general appearance of the farm. The trees most suitable for this district are sugar and red gums, Remarkable and Aleppo pines, pepper trees, white cedar, white acacia, and the swamp oak of New South Wales. Well-worked fallow is preferable to holes for planting. The best time to plant is early in the winter. This gives the tree a chance to become established before the dry summer sets in. Frost has no effect on pines, which should be tied firmly to small stakes. Deciduous trees should be planted as soon as they have shed their leaves. Sugar gums and pepper trees will be affected by frost unless protected. To do this, cut a super. bag in two, putting half the bag around one tree, and keeping it spread with three or four sticks. This extra work at planting time will save a lot of watering in late spring and summer. Leave the bags around the trees until November. When planting use an ordinary digging fork, and work the ground well. Care must be taken to spread the roots. This gives the tree a good hold of the ground, and the roots procure moisture from a greater area. If bamboos are used they must be covered at least 2in. and the earth pressed firmly around them. Plant all trees 8ft. apart each way. If they all grow, thinning is easy after three or four years, and the trees cut out make firewood. The great secret of success is keeping the ground loose around the tree after every rain or watering. I believe in watering where possible if the spring is dry, but trees that are alive at New Year will nearly always live without any more watering. With the foregoing methods I have had very good results. Out of 1,500 trees planted last winter over 1,300 are living. Sugar gums first grown in pots and planted out last July are over 6ft. high, and some first grown in bamboos are 4ft. high. Open root red and blue gums are also 4ft. high. These were all protected against frost. For shelter around a garden, gum trees must be planted at least 85ft. from the garden. Pines and peppers can be planted within 30ft. without causing trouble. The Aleppo pine, although not so beautiful, will grow in poorer soil and on a lighter rainfall than the Remarkable, and it is not so likely to die at four or five years. Light ploughing between the trees every year will more than repay the cost, as it conserves the moisture. Trees will often do well for three or four years on a limestone subsoil, but those on ground with a good clay subsoil will usually do better after reaching that age. A good method of watering young trees is to hoe a trench around each tree, and into this put about 4galls. of water. During the next day dig the earth back around the tree. This keeps the water where desired, and digging the earth back again destroys the cracks and leaves the ground loose." Mr. G. Thorn also read a paper. While there were no natural forests in this district, he said, different varieties of the eucalyptus family did well. South Australia was noted for the rapidity with which its trees grew. Continuing, the paper read :—" The time for planting all varieties of pines, white cedar, white acacia, plane trees, willows, firs, is early in the winter, so that the young trees will get the full advantage of the rain. Gums must be protected from the frosts. This entails a good deal of work, and an easier plan is to order trees in tubes and leave them in a case well packed together in a sheltered spot, taking care to water them when necessary. Prepare the ground by ploughing to a depth of 6in. or 7in., and allow it to lie in the rough until the end of August. Then harrow it down after a rain and conserve as much moisture as is possible. Plant the trees out the first week in October. Put them in the ground as deep as possible and leave only an inch from the ground to the first leaves. Put the earth in firmly around the bamboo to exclude all air, and leave it loose on the surface. If the weather remain dry, hoe a trench around each tree, but not touching the tree, sufficient to hold 3galls. or 4galls. of water. Then pour in the water, and next morning hoe the trench in again, but never touch the ground whilst it is in a boggy condition, and do not allow it to become too dry before hoeing. Usually three to four waterings are sufficient for gum trees. The distance between the trees depends on the objective. If straight timber for rails, &c., is required, it is advisable to plant from 6ft., 8ft., to 10ft. apart, but if planting for shade and shelter and general appearance, plant from 15ft. to 20ft. apart. The Remarkable pines in the Angaston Recreation Park are about a chain apart, and are just about the right distance. The trees in the fine avenue of Moreton Bay figs along the bank of the river in Gawler are somewhat closer, and ultimately they will injure one another. A tree must have room to develop. The most deadly enemy of the young gum trees is certainly the frost that is encountered almost every year. Sometimes a tree will be killed in its third year, and it is practically impossible to guard against this. Rabbits and hares are both very destructive, therefore it is most important to wire net around the trees. Cattle also are mischievous if they get into a plantation. A good strong fence is a necessity. Grasshoppers and caterpillars will destroy the young trees. These cannot be effectively guarded against. Undoubtedly it is a good idea to plant an area—say of half an acre—either oblong or square, in each paddock, chosing the best of the land for this purpose, to act for shade in the summer and shelter in the winter. If sheep get adequate shade from the fierce sun, from a farthing to a penny per pound more would be secured for the wool. With reference to the more ornamental trees, the sterculias stand very high in public estimation, and rightly, too, for they are highly ornamental. One variety of these, called the flame tree, is a fine sight while in flower. Another variety is commonly called the Kurrajong. I can recommend the Nerium family on account of the splendid growth made by these in the district. The tagasaste is very suitable for hedges, being a fast grower and very hardy. It is my earnest desire that each landowner will take immediate steps to plant a few hundred trees this season, and by doing so not only increase the selling value of the properties, but make the place a more desirable one in which to live, and quite possibly increase our annual rainfall."

Spalding, July 18.

(Average annual rainfall, 20·25in.)

PRESENT.—Messrs. T. J. Preiss (chair), Thorn, S. Hennessy, J. J. Gale, P. E. Kelly, P. N. Neill, A. B. Jones, J. Pluckrose, W. M. Summerville, J. Marron, A. J. Howley, T. Walsh, and D. A. Campbell (Hon. Sec.).

WOOL-CLASSING ON THE FARM.—Mr. F. M. Richardson read an interesting paper on this subject. The farmer with a few sheep, he said, suffered a greater loss proportionately than the large sheepowner through carelessness in preparing wool for market. There was no need to pay a skilled man to class farmers' wool, for a little care and the exercise of common sense was all that was necessary. The best prices could not be expected when different kinds of wool were bundled together, or Merino and crossbred were mixed in the same bales. Similarly the inclusion of dirt, chaff, &c., in the bales, loose packing, or other evidences of lack of care inevitably lowered the price commanded. The paper then continued :—" The shearing must be done on a clean floor, or the wool will become dirty. As it is of the utmost importance to favorably impress buyers, all fleeces should be skirted regularly, not necessarily deeply. In many cases only the dirty edges need be taken off. In other lots, such as wools of very light condition, it may pay to skirt off all the burry pieces. The fleeces should be rolled neatly from breech to shoulder, and they must never be tied with string. In cases where Merino and crossbred sheep are kept, it is advisable to shear them apart, so that the wool from each lot can be kept entirely separate. Heavy, matted, or discolored fleeces should be broken up and mixed with the skirts. It is well to pack bellies, pieces, locks, and stains separately, even if they have to be packed in bags, for mixed lots seldom bring their full value. The bales should be branded legibly with the name of the farm or owner, as insufficient branding often leads to trouble. They should not be too heavy, and should be numbered consecutively from the first to the last of the clip."

Yongala Vale, July 14.

(Average annual rainfall, 13in. to 14in.)

PRESENT.—Messrs. T. Keatley (chair), T. Battersby, C. and E. Fowler, E. Cooper, J. Barker, F. Laubsch, G. I'Anson, B. Webb, G. H. Jansen (Hon. Sec.), and one visitor.

HANDLING WHEAT IN BULK.—In a paper dealing with this subject, Mr. Battersby said he was unable to see where the farmers would gain any advantage with the introduction of the system of bulk handling of wheat. The suggestion that they would only have to purchase sufficient wheat sacks for two or three days' stripping meant that they would have to stop their harvesters whilst the wheat gathered into these bags was carted to the station. The cost of handling the wheat in bulk would be greater than that involved in the present system, and the cost of erecting elevators would be very heavy. The countries where the bulk system was at present being successfully worked were those in which the prices of material and labor were much lower than in Australia.

IMPLEMENTS AND MACHINERY.—Dealing with this subject in a paper, Mr. E. Fowler said the average farmer required a shed of at least 60ft. x 22ft. to afford due protection for his implements. Iron was preferable for roofing, as there was no danger from fire. At the end of the year all the machinery and implements should be overhauled, nuts being tightened, and all working parts oiled. When harvesters were stored a prop under the off side of the comb would have the effect of relieving the rack of portion of the weight, and thus obviating the tendency of the off side to dip deeper into the crop than the near side of the comb. All the woodwork should be painted yearly. Drill wheels should be periodically attended to, and ploughs and cultivators should be kept under cover. Broken castings should be renewed immediately.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Balaklava, July 12.

(Average annual rainfall, 16·03in.)

PRESENT.—Messrs. H. L. Twartz (chair), E. Fisher, R. S. Goldney, G. C. Neville, H. P. Burden, H. M. Tuck, A. P. Anderson, J. Spillane, L. Hoepner, O. Upill, W. J Gleeson, R L. Butler, B. R Banyer (Hon. Sec.), and one visitor.

SHEEP ON THE FARM.—Mr. Spillane said, in a paper on this subject, that the smallest farmer should not neglect to keep a few sheep. In addition to providing the mutton supply and assisting in the destruction of weeds on the fallows, they returned a considerable profit in the wool. Merinos were not so difficult to keep inside the fences as were the crossbreds, and the wool return from any rejected for export was greater in the case of the former. He had experimented with oats for green feeding with satisfactory results, and he advised putting this crop on stubble before seeding to produce early feed for fattening ewes and lambs. Sandy soil, fallowed in August last year, was sown with 1bush. of oats to the acre. This produced late spring green feed, and kept the fallow from drifting. The lambs could be tailed when between the ages of three days and two months, and he preferred the knife to the searing iron for this purpose, Stockholm tar being applied to the cuts. Foxes, which were causing trouble, should be poisoned during March, April, or May, a trail being used, the baits consisting of sheep's liver and strychnine. Mr. Upill said the best lambs were those that were first ready for the market; consequently he advised the crossbred. The knife was better than the searing iron for tailing. The latter was slower, and the wound did not heal so quickly or well. Mr. Butler preferred the crossbred lambs. It did not pay to hold them over for wool, and those fattened better than the Merinos. They should be tailed when between 14 and 21 days old. It was necessary to do this at the proper time, and he had found that lambs tailed with a knife were in some cases as much as 7lbs. better than those on which the searing iron had been used. Mr. Gleeson preferred the Merinos. Crossbreds were difficult to keep in the paddocks. There was always a sale for wethers, and it might pay better to keep these better than ewes. Mr. Neville liked the Shropshire and Border Leicester cross. Last year he turned the rams in with the ewes that had lambed too early for the feed and secured a second lambing, which sold at very satisfactory prices locally. In a season like the present it would pay to kill the lambs rather than run them on short feed, and put the rams with the ewes again. Good summer lambs were worth about 15s. in April or May. Oats sown on the stubble could be more profitably fed to great stock than to sheep.

Blyth July 18.

(Average annual rainfall, 16·46in.)

Present.—Messrs. A. L. McEwin (chair), A. P. and F. W. Kirchner, J. S. McEwin, S. R. Neville, F. Willshire, J. H., W., and J. Pratt, J. C. and A. H. Schulze, W. J. Ninnes, C. Lehmann, C. P. Schuster, A. Hamilton, T. Roberts, S. G. Shepherd, T., M., and J. Williams, E. C. Deland, H. Neumann, D. Crawford, H. D. Pedler, H. W. and W. O. Eime (Hon. Sec.), and three visitors.

Inspection of Mill.—At the invitation of Mr. Deland, members inspected his mill and were much impressed with the extent of the plant and the nature of the processes through which the grain passed before and during the operation of milling.

Annual Report.—The Hon. Secretary's report, which was presented at the meeting after the inspection, showed that eleven meetings had been held, papers being contributed at nine, with an average attendance of 21·4 members and 9·4 visitors. The year opened with 23 members on the roll and closed with 39. One homestead meeting had been held.

Pig-Raising.—A paper on "Pig-raising" was contributed by Mr. J. A. Pratt, as follows:—"With proper management pig-raising is a very profitable industry. In order to obtain the greatest success there must be regular and liberal feeding, with absolute cleanliness and kindness in handling the animals. The boar is a very important member of the herd, and should be a pure-bred animal of the best type obtainable. If the progeny are for market, get a boar that will produce the type of pig that brings the highest price. The introduction of a fresh strain will show more quickly in pigs than any other kind of live stock. If breeding stud pigs, careful mating is a most important point. The sow should be roomy, long, and deep, with broad loins and strong back; she will then have the capacity for carrying large litters. Like the boar, the sows should not be used for breeding until a good age. Sows breeding too young produce either small litters or large ones of uneven, weakly pigs. The young pigs should be weaned gradually, giving them small quantities of food when they are about a month old. This will relieve the sow and they will thrive better. If they are weaned suddenly they become stunted and do not afterwards grow as rapidly as they should. At two months their teeth are in a suitable condition to grind food. This, as a rule, is about the best period to wean them, unless they have been farrowed in the winter, when they will require to be longer with the sow. The Berkshire is the favorite breed in Australia, being well suited to the climate. In South Australia and some parts of Victoria the Berkshire and Essex cross is favored, and in other parts the Berkshire and Yorkshire cross is preferred. The Tamworth pig is noted for the great portion of lean bacon of the highest quality which it produces." Mr. McEwin, in discussing the paper, said that pigs paid best when eating waste stuff. It paid better to fatten stores than to breed. There was greater profit in January, February, and March than during the remaining nine months of the year. His pigs had not put on more than 20lbs. in weight since the frost set in. The Berkshire was the most profitable breed, and for breeding it was best to have small paddocks netted, with a straw stack in the centre.

Bacon-Curing.—Mr. McEwin would lay the meat flat on a table or flag shelf, sprinkle with salt and brown sugar and a little saltpetre. It should be turned two or three times a day for about two weeks. Mr. Schuster, to cure bacon, would mix a brine of 7lbs. salt, ½lb. saltpetre, and some brown sugar. Boil and let it cool over night, and then put the meat in a trough covered with the brine, and turn occasionally. Bacon must be in the brine for about two weeks and then be put into fresh water one day, and then hung in the smoke house. Mr. Pratt, to cure sides, would lay the bacon out, sprinkle with 2lbs. salt, a packet of spice, saltpetre, and brown sugar, and then would roll it and hang it up.

Nantawarra, July 17.

(Average annual rainfall, 15·90in.)

Present.—Messrs. T. Dixon (chair), S. Sleep, F. J. Sutton, A. F. Herbert, R. D. Nicholls, W. Smith, R. P. Uppill, G. L. Tucker (Hon. Sec.), and one visitor.

Laying Out and Working a Farm.—Mr. Sutton read a paper on this subject. Having touched upon the need for a thorough knowledge of his various soils, thorough cultivation, judicious manuring, and the selection of crops suited to the capabilities of the different paddocks, the writer said the homestead should be placed near to the main road, if possible, and be in a good position to work the farm. Due regard must also be paid to water supply. All buildings should be made substantially. The stables to stall at least 16 horses—assuming that the farm comprised about 1,000 acres—with a couple of loose boxes provided. The chaff and engine house he would include under the same roof as the stables, to minimise cost of timber and iron. The barn erected, a lean-to might be attached to either side. One for implements and the other provided with movable grating, for shearing during the season and general use at other times. Cow bails could also be put under this roof. Durable implements and machinery, simple as possible in construction, should be preferred, and these should be under cover when not in use. A few pounds spent in fitting up a blacksmith's shop would be repaid many times over in charges and time saved for repairs. Pigs and fowls with attention paid well. System should govern all the operations of the farm, and liberal dressings of superphosphate should be put in with the grain. To make a farm valuable it must be so worked as to produce good crops. The appearance must be orderly and tidy, and the management systematic throughout. Mr. R. D. Nicholls said that the house should be built west of the stables, which should be built open towards the east. In a lean-to, connected with the stables, harvesting machinery, etc., that was only required at certain periods should be kept out of the way. He favored building sheep-yards on a rise, as sheep were more easily driven up hill. The water-troughs should be on a limestone patch, not too near the stables. This would do away with mud and ensure a pure water supply. He also considered it essential that a few small paddocks should be set apart close to the homestead, in which to conduct experiments. Mr. R. P. Uppill considered that the writer of the paper advocated too extravagant a start. It was better to get to work on the land at first. This was the most necessary improvement, and the other things would gradually come in course of time. Mr. Smith advocated the making of wide gateways, as the time had arrived for quick working of the land, and consequently wider implements and machinery. Mr. Sleep agreed with the writer of the paper that the things he had mentioned were necessary, but thought it better to put the capital on the land, and to do other things by degrees. It was advisable to exercise caution in expenditure when making a start. Mr. Sutton, in reply, did not think it was advisable to keep harvesting machinery too near the stable. In regard to the water-troughs, he said a limestone rise was not always convenient, but a few loads of stone around the trough answered the purpose admirably.

Sparrows.—Mr. Sleep drew attention to the increasing number of sparrows, and considered that united action should be taken for their destruction. Members agreed with the speaker, and a general discussion took place as to the best methods of destroying the pests. As a recommendation from this Branch, the following resolution was passed:—"That the attention of all farmers is drawn to the necessity of each doing his share in the destruction of sparrows."

Northfield, July 1.

(Average annual rainfall, 19in.)

Present.—Messrs. Williams (chair), Dall, Kimber, Rowe, Goldney, E. W. Kelly, Wright, Roeger, and Mitchell (Hon. Sec.).

Seeding.—A short paper on this subject was read by Mr. Goldney. In order that a streaky drilling might not result, he said, it was necessary to level the seed in the box after filling. This would give an indication of how the seed was running, and if it were being distributed unevenly this could be remedied by the hand being thrust down into the pocket and the seed loosened. When the drill was becoming blocked by clay or moist earth, a good plan was to lower the pole and so raise the whole of the hoe. Where time was available, crossdrilling was a good idea, but, as a substitute, the broadcasting of a small amount of seed after the drill would be found beneficial. This applied specially to oats. Members generally agreed that crossdrilling took too much time to be practicable.

Riverton, May 22.

(Average annual rainfall, 20·48in.)

Present.—Messrs. F. Phillips (chair), Camac, J. W. Kelly, W. B. Davis, W. Legoe, W. Stacey, C. H. Castine, R. H. Cooper, E. A. Gray (Hon. Sec.), and one visitor.

The Pig Industry.—Mr. T. Camac, in a paper under this heading, said the pig industry, on account of the uncertaintly of the market, had been neglected. An oversea trade could be built up, as England imported £25,000,000 worth annually, and Australian bacon was realising from 60s. to 65s. per hundredweight there. He had found an acre of ground sown to barley annually was sufficient to keep about six breeding sows from May until the end of October, with the addition of a small ration of corn daily. Stone styes, 8ft. by 8ft., floored with flag, well ventilated and drained, were recommended. The Berkshire was a quick growing pig. Inbreeding should be avoided, and great care was necessary in feeding the breeding sows before and after farrowing.

Saddleworth, July 18.

PRESENT.—Messrs. Manning (chair), F. H. Kelly, Cornwell, Rex, Theo. Eckermann, Townsend, Scales, Snell, and Coleman (Hon. Sec.).

COST OF STRIPPING AND HARVESTING WHEAT.—Considerable discussion occurred on the question as to what might be taken as a fair average day's work with a stripper and a harvester, one man only with each. In stripping he must empty and "throw up" the heap; in harvesting he fills the bags, leaving them standing in heaps unsewn. Seven acres a day in a crop going 20bush. was finally decided as a fair average; this allows for a late start occassionally owing to damp or broken weather conditions in stripping. One acre more is allowed with harvester. The following estimates were submitted:—

ESTIMATED COST OF STRIPPING, WINNOWING, AND BAGGING A 20BUSH. CROP.

By Contract (Stripping at 22s. 6d. per day)—	£	*s.*	*d.*
Seven acres per day, 140bush. cost 22s. 6d., 250bush.	2	0	2
Winnowing 250bush. (77 bags at 195lbs.) at 6d. per bag	1	18	6
Wear and tear winnower, oil, &c., per day	0	2	6
Cost of stripping 250bush.	4	1	2
Cost 6s. 8d. per acre. 1bush. costs 4d.			
Actual Cost to Farmer.—			
Three horses' feed one day, 112lbs. chaff at £3 10s. per ton	0	3	6
" " 42lbs. hay at £3 per ton	0	1	2
Stripper, £50, wear, tear, and depreciation at 10 per cent. for 30 days, per day	0	3	4
Harness, wear, tear, &c., and oil per day	0	0	4
Team of horses, depreciation per day	0	1	0
Labor, one man stripping	0	8	6
Cost of stripping 140bush. only	0	17	10
Winnower and tools, wear and tear, &c.	0	2	6
Three men at 8s. 6d. per day, winnowing and sewing up bags	1	5	6
Cost of stripping 250bush. and cleaning only	£3	3	8
Cost 5s. per acre. 1bush. costs 3d.			

ESTIMATED COST OF HARVESTING AND BAGGING A 20BUSH. CROP

By Contract (Harvesting at 27s. 6d. per day).—	£	*s.*	*d.*
Eight acres per day, 160bush, cost 27s. 6d. 250bush	2	2	11
Sewing 75 bags (250bush.) at 1d. per bag	0	6	3
Cost of harvesting 250bush.	£2	9	2
3s. 11d. per acre. 1bush. costs 2¼d.			
Actual Cost to Farmer.—			
Four horses' feed, one day, 150lbs. chaff at £3 10s. per ton	0	4	8
" " 56lbs. hay at £3 per ton	0	1	6
Harvester, £85, wear, tear, depreciation (at 12½ per cent. for 30 days) per day	0	7	0
Harness, wear and tear, oil, &c., per day	0	0	6
Sewing 75 bags (250bush.) at 1d. per bag	0	6	3
Team of horses, depreciation per day	0	1	4
Labor, permanent farm employé, one man per day	0	8	6
Cost of harvesting—160bush cost	£1	9	9
250bush. cost	£2	6	6
3s. 9d. per acre. 1bush. costs 2¼d.			

Gain—Harvesting, £10 18s. 1d. per 100 acres.

Salisbury, July 1.

(Average annual rainfall, 18·57in.)

Present.—Messrs. Moss (chair), E. V. and A. J. Harvey, Tate, Frost, Bussenschutt, McGlashan, James, Neal, Judd, Bagster, Day, Fleet, Basford, Jenkins, and three visitors.

Question Box.—The meeting took the form of a question evening. Mr. Neal had successfully bred four foals from a mare with a bridle tooth. Messrs. Harvey and Bagster also supported the contention that mares with bridle teeth would breed. When trees bloomed and set out of season, the crop should be removed, as it was worthless; in any case it would badly affect the following season's crop. Oranges sometimes matured satisfactorily out of season. Members favored discriminate planting of stunted varieties of trees for shelter for stock. However, these would be found great robbers of the soil if planted extensively. There was a division of opinion as to whether it paid to grade seed wheat. Applications of Bordeaux mixture just before the bursting of the blooms were recommended for curl leaf disease.

Two Wells, July 15.

(Average annual rainfall, 16·36in.)

Present.—Messrs. A. Rowe, P. C. Cooper, H J. Wasley, R. Kenner, E. Green, L. Simpkin, J. Hanrahan, J. Rowe, and L. H. Dawkins (Hon. Sec.).

Breaking in Horses.—Members considered the best time to break in a horse was the latter end of the summer, when the beast was rising three years. It should be taught to lead and guide before being placed in harness. For the first few weeks it should be given little work. Kindness and firmness on the part of the person doing the handling were essential. The Hon. Secretary preferred handling the foal from its birth, but members thought this tended to make it crafty and cunning.

Watervale, July 14.

(Average annual rainfall, 27·17in.)

Present.—Messrs. E. E. Sobels (chair), W. Smith, G. Parker, C. Solly, A. Davis, O. Dunstan, F. Burgess, A. Burgess, D. Guthrie, O Ward, J. Scovell, F. Hunter, F. Hamp, J. Hamp (Hon. Sec.), and three visitors.

Farmers' Wool Clips.—The following paper was read by Mr. G. Parker:—"This question should interest every farmer, whether he has 50 sheep or 500, as the monetary gain which can be derived from the small amount of time spent at shearing cannot be overestimated, especially if it is done in a systematic way. Some say that with small lots of wool it does not pay to go to the time and trouble of classing; but having had practical experience in the classing of wool, I claim that the time is coming when it will be necessary for the farmer, whether big or small, to pay more attention to this part of the business. I do not think that there is a gardener in this district that does not strive to make the best possible sample of his currants or other fruit before placing them on the market. We find small lots of fruit as well and sometimes better graded than large lots. If it pays the fruitgrower to go to this trouble, will it not pay the farmer to the same extent? In the classing of small clips care should be taken that it is not overdone, as there is an agreement between the woolbuyers and brokers that any lines of less than four bales are to be treated as star lots, which are sold after the main catalogue has been dealt with, and which, therefore, do not command the same competition as a lot of four bales or more. The average farmer's flock very often contains a certain percentage of crossbred sheep, more especially lambs, as the majority of farmers breed export lambs. These fleeces should be very carefully watched and placed in a bale by themselves, as they very often lower the selling price of the whole clip if allowed to remain with the Merino fleeces. Care should also be taken that the shed is perfectly free from vegetable matter, such as chaff, straw, &c., as the introduction of this into wool has a very detrimental effect. After the sheep has been shorn it is necessary to throw the fleece upon a table without unnecessarily breaking it. Skirting depends largely upon the size of the clip to be handled. With a small lot it is not necessary to skirt heavily, but if the clip is from 300 sheep or more it is very advisable to skirt all the vegetable matter off the fleece. Start skirting from the back of the front leg, and work towards the head. After having treated the front portion of the fleece, give attention to the hinder portion, and skirt from the back of the arm to the point of the tail. The amount of skirting varies with the amount of inferior wool which is upon each fleece. After skirting the hind portion of the fleece, bring that back to about the middle of the fleece, and throw both edges into the centre of the table and roll the fleece. As a rule the shoulder will be on the outside. This generally has a more attractive appearance than any other portion. After this, all that is necessary with small clips is the baling and taking out the discolored and inferior fleeces. Wool that is carefully pressed generally has a more attractive appearance when opened for the inspection of buyers. The skirtings from a small clip of under 300 could be baled n one lot, with the exception of the urine-stained purses from the crutches of the ewes and bellies of the wethers. This wool will not scour clean and will consequently not take dye so well. With a clip of, say, from 300 or more, it is possible to skirt more heavily and class the wool into two or three different lots, and also to re-skirt the pieces and make two lots of them. After the fleeces have been skirted, place them in a bin until there are sufficient for baling. Put all the lightest and brightest fleeces together and brand them 'AA.' The heavier and stronger, brand 'A,' and the very fatty and discolored ones, brand 'B.' Skirt the pieces and brand the best 'A Pieces,' and the rest 'Pieces' The bellies must also go by themselves. If any crossbred wool has been shorn, it could be rolled and placed in a bale or bag by itself. The locks and floorings can all be swept together and put into one lot. After the wool has been dealt with in this manner it is in a form attractive to buyers. Placing the wool into different classes enables them to form a better idea of the yield of scoured wool in the clip, and as a result the line is more sought after. In conclusion, I should like to draw attention to the South Australian School of Mines in connection with wool-classing, as the work done by the expert and students of that institution has been the means of bringing thousands of pounds into the pockets of the agriculturist and sheepfarmer in South Australia." The majority of members agreed with the views expressed by the writer of the paper, and thought it advisable for farmers to pay attention to the classing of their wool, whether they had large or small flocks.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Pine Forest, June 17.

(Average annual rainfall, 14·15in.)

PRESENT.—Messrs. D. Carman (chair), A. Hewett, H. Adams, S. Barr, W. Attenborough, R. D. Goodridge (Hon. Sec.), and one visitor.

MARKETING WOOL.—Mr. Carman read a paper on this subject. Whilst the Wool Instructor had urged that farmers were losing 1d. per pound on their wool through careless marketing, he said, the wool brokers stated that it would not pay to be too particular in this direction. He suggested that the brokers might handle farmers' clips in the way they dealt with the skins, *i.e.*, classifying them and selling according to value. Mr. Hewett thought the brokers should not be called on to do this, the farmers should class their wool themselves. Co-operative classing and marketing should be an advantage. If small clips were marketed together as one line, a better price would probably be secured. Mr. Attenborough did not consider Mr. Hewett's suggestion practicable, some farmers might consider their wool better than that of others; consequently, there would be dissatisfaction. Little benefit was derived from classing small clips.

WESTERN DISTRICT.

Coorabie, June 14.

(Average annual rainfall, 11in. to 12in.)

PRESENT.—Messrs. C. T. Giles (chair), W. H. Wheadon, D. Riddle, C. B. Atkins, V. S. Kinsley, N. M. Roberts, C. Hobbs, E. Attick, R. Weston, F. Underwood, J. Murray, W. Cousins, C. A. Fox, H. Coppins, E. Oats, E. Stretton, B. Giles, W. Grivell, G. Menzel, G. Riddle, F. Gurney, T. Gurney, G. Cabot, H V. Hobbs (Hon. Sec.), and five visitors

PIG-KEEPING.—Mr. V. S. Kinsley read the following paper :—" It is a surprising fact that in a district like the West Coast, where we practically rely upon our wheat crops as the money maker, more serious attention is not given to pigs. Most farmers are in a position to keep a cow or two, and so with a fairly constant yield of milk over and above that which they can themselves use, here lies the foundation for profitable pig-raising. We all know that it does not pay to rear calves, but it does pay to keep pigs, and very handsomely, too, if the farmer will treat the question as a serious business matter. The Irish farmer regards his pig as the ' rent payer,' and we might reasonably do the same From the Australian newspapers it is plain that there are huge possibilities for South Australia as a pork and bacon producer. We must produce good flesh, and that must be done quickly. A pig will eat practically all kinds of food, and if this is judiciously prepared it will rapidly convert young pigs into animals of marketable size. Situated as we are, we have no chance of supplying the freshly-killed carcass to a bacon-curing factory or to a freezing works for export, therefore we must study carefully the subject of curing the hams and bacon, and there is no reason whatever why a farmer should not do it as well as any wholesale factory. Great care must be taken in cutting the animal intended for curing into the required shapes. Cutting anyhow, as though we were cutting up a ration sheep, will not do. It must be cut to a certain pattern or style to suit the merchant, and later on the retail grocer. In preparing pork for bacon and ham, let the pig hang at least 12 hours before cutting, that is if the weather is suitable. Do not try curing in very hot weather, though this can be done as in colder seasons, but much more care must be taken throughout the proceedings. The pig must be well bled, and in warm weather all the bones should be taken out For salting use a shallow packing case. If it is the intention of the farmer to go in for this work thoroughly I recommend a specially made trough, say, about a foot deep and 3ft. long by 18in. to 2ft. wide. However, in any case the main point is to retain the brine or liquid about the flesh until the period of salting or curing is complete. For a pig of about 150lbs., use about 10lbs. of salt, about a small cupful of saltpetre, and about two large cups of sugar, *i.e.*, something like a pint in measure. To this some curers fancy the addition of a little spice or ground ginger. We may safely add about 2ozs of mixed spices The whole of the salt and other ingredients should be well mixed together, and then some should be sprinkled in the trough bottom. The sides of the pig should be placed in skin downwards and a plentiful supply of salt mixture rubbed in. On top of this place the hams. After about a week turn the sides and hams face downwards, rub well, and repeat this process in a fortnight. In three weeks the bacon and hams should be ready to take out. After this wash off all surplus salt and hang them up to drip. In about a couple of days do any rolling or smoking that is intended. In the case of rolling sprinkle the flesh with flour and dry thoroughly with a cloth. Then use skewers on a board and roll up towards the shanks with the best cord obtainable. It should then be bagged and hung in a draught for at least a month, when it is fit for use. For smoking use a large packing case ; suspend the hams and bacon from the lid or top, and cover it with a few bags to keep in the smoke. The fire should be about 5ft or 6ft. away from the case, with a trench cut about 6in. by 6in. running under the case to convey the smoke. Use wood that does not burn too fiercely. Sawdust or cocky chaff is good, in fact, anything that smoulders rather than flames, and so creates a good smoke. The bacon should be left in the smoker until it attains a nice brown color. A little practical experience will soon teach the depth of color that is required according to taste. For market purposes a light-golden brown is best. Never place the smoking fire directly under the smoking case As to the best type of pig to keep, I most strongly recommend the Essex. It is easily produced, being a cross between the Black Berkshire and the Red Tamworth. The former carries a great amount of fat and the Tamworth is principally lean ; so the result gives ' streaky bacon.' This breed is admirably adapted to a warm climate and does very well in Australia. The young pigs up to, say, 10 weeks old are somewhat disappointing in their growth, but after that date it takes a very good judge to guess their weight. They generally weigh much more than their appearance suggests. The pigs should always be well housed and attended to regularly. They thrive much better when kept under clean conditions and in styes that are draught proof, particularly when very young. The youngsters should always be encouraged to feed; they soon learn to eat. I recommend placing a low, shallow trough in such a position that only the suckers can get to it. Start feeding from this with stale bread crusts and other such odds and ends with skimmed or separated milk. The addition of a little treacle and hot water is a great inducement for the little ones to look out for their own living. This is a great saving on the sow. Molasses is a good addition to the general feed for pigs of all ages. The trough should never contain more feed than will be cleaned up each time. Always endeavor to keep increasing the daily rations. I strongly recommend barley in preference to wheat as a general feed. If it is intended to take up pig-keeping as a serious business proposition add maize and a small proportion of linseed. Always remember that separated or skimmed milk is far preferable to water. It contains a certain amount of nourishment. Sows in their third and fourth litters are the best from which to breed, particularly for the maintenance of the standard of the stock and breed. The litters are always larger, and so are the youngsters; they do better, and the sow does not lose so much of her condition. I do not favor the practice of using young boars." Mr. E. Oats favored the Berkshire breed of pigs, and expressed the opinion that the Tamworth was difficult to fatten. He agreed with feeding milk of any sort to pigs whenever possible, and considered wheat heads a good and economical food. Any dry grain should be scattered about in the loose earth. The pigs seemed to enjoy "nosing" about for it and chewed the grain better; therefore getting more sustenance out of it. The Chairman said pigs throve better on three small feeds per day than two larger ones. Mr. Atkins favored the Berkshire breed. He advised the use of brown sugar with the pickle Other members had used molasses instead of sugar with satisfactory results.

Coorabie, July 12.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. C. T. Giles (chair), E. J. Stretton, D. Riddle, J. H. Murray, N. M. Roberts, W. H. Wheadon, C. B. Atkins, V. S. Kinsley, V. R. Weston, F. Woodforde, E. J. Oats, C. A. Fox, C. Hobbs, W. G. Wheadon G. Menzel, F. Gurney, A. Broadfoot, T. Gurney, B. Giles, A. Riddle, W. Grivell, G. Riddle, H. V. Hobbs (Hon. Sec.), and six visitors.

Producing and Marketing Wheat.—In a paper under the heading "The Cost of Producing and Delivering Wheat to Market," Mr. V. S. Kinsley said—"In preparing an estimate of this description one thing must be borne in mind, and that is that all farmers do not think or act alike, so that there may be a great diversity of opinion, and still more so as the land included in the area represented by this particular Branch of the Bureau at the Far West end of cultivated South Australia presents so many changes in its character. For instance, we have the hard, red flats, and the lightest soils—almost pure sand in some instances—of the mallee country; consequently the cost in seed and super., and of tilling the soil into a good seedbed will vary as much as 100 per cent. to 200 per cent. in the different classes of land. My contention at the outset is that statistics on this subject can only be taken as a guide to enable each individual farmer to arrive at his own particular cost. I shall purposely refrain from comment as to how any class of land should be prepared for a seedbed, only touching upon such points as are necessary to arrive at an average cost. I am presuming that all the horses will obtain their own feed during the off working seasons, *i.e.* on the stubbles, self-sown and permanent grass lands. So that it would be unfair to charge up against the cost of wheat production the keep of horses during such period. By taking the rent and taxes of the whole block into consideration, this charge will cover their grazing cost, coupled with their manurial value in the stable yard and paddocks. Again, there arises the cost of fencing and wire netting, and against this I propose to grant a 20 years' life to a well set up rabbit-proof fence; consequently this will add a 5 per cent. debit to the cost of each season on the cultivated area. I will presume that we have a block of, say, 1,000 acres, although its size matters nothing, most of which is cleared, and 400 acres will be in crop and 200 acres under fallow, the balance being made up from rough country, scrub, and home grazing paddocks. I allow cost of hay feed for the horses during the working season, chaffed or otherwise, and I make no difference in cost whether it is chaffed or not. If we have a chaffcutter and engine or horseworks, I consider that the interest, labor, and depreciation in plant is compensated for by the loss that occurs by waste in feeding long hay as against cut. I allow nothing for the residual value of a crop of wheat for feed purposes, *i.e.*, cocky chaff or collected straw, because, in my opinion, after we take into consideration the cost in labor of saving and using, combined with wheat and other ingredients necessary to obtain value as hard horse feed, these cost considerably more than hay to the farmer; therefore I am charging up the cost of hay as the cheapest feed. In arriving at such cost I take it that its value can only be that which would ultimately be calculated from the average wheat yield per acre. So that if the total crop averages 10bush. and sold at 3s. per bushel, the hay would be worth that amount to us and no more, which means 30s. per acre. It is only fair to take the cost of machines, &c., at their new value. I charge no interest upon them at all, but depreciation on a 10 years' life, which means 10 per cent. per annum. Some of the implements will last a careful farmer much longer than this, and some may not last so long. I think, therefore, this charge will be sufficient. I have carefully read and studied a paper on the same subject that has been written for another Branch of the Bureau, and appearing in the last April number of the *Journal of Agriculture*, page 1050, and I do not agree with several of the charges that are made there. Particularly I cannot allow any interest charge on general capital to be made against the cost of production, for in my opinion the interest charges will be contained in the profit derived from selling or even using the produced wheat. In support of this opinion I state that if a person invests in a bank or industrial company, the interest or dividend that he receives for the unsecured loan of his money is solely upon the profits of that trading concern, and only then, after full allowance has been made for depreciation. One man can fallow and seed the 400 acres with eight horses in about 10 weeks, and harvesting will take about the same period, damp or wet weather included, with the assistance of a boy to sew bags and bring a change of horses for harvester. I allow ¾bush. seed and about 55lbs. super. per acre, eight horses averaging £25 per head, plough £50, cultivator £25, drill £50, harvester £100, and dray £20. Delivery of wheat to port from Coorabie is worth 6d. per bag, sacks being worth another 6d., although they actuallly cost a little more, but as the sack is weighed in and paid for at the wheat price, this reduces its actual cost slightly. The wages of one man for fallowing 200 acres and afterwards ploughing, together with the other operations at seeding time—completing the 400 acres for crop—will absorb 14 weeks at the rate of 30s. per week plus cost of board and lodging at 12s. per week, equalling £29 8s. Harvest wages at same rate, with the addition of a boy, whose wages and keep would be 22s. per week extra, will equal £32 for the 10 weeks. I do not allow any charge for depreciation on horses against the cost of wheat production, for in the hands of a shrewd farmer he will have at least 50 per cent. of mares in the team; therefore the annual value of foals will cover the loss on capital on this item. The cost of hay at 30s. per acre from 35 acres will mean £52 10s., which amount should be sufficient to see the team through the working seasons. Depreciation is to be allowed upon about six miles of rabbit-proof fence surrounding the crop and in subdivision, costing about £200 in capital outlay, and 5 per cent. will be adequate. There is another cost to be averaged, and that is for scrub land that has to be cleared. If half the area be allowed under this head at 15s. per acre, and a 5 per cent. charge made against it, this will be somewhere near the mark. The whole of the costs enumerated will work upon such average figuring at £326 1s. 10d., which means 16s. 3½d. per acre. The profit on a 10bush. average at 3s. per bushel at the Port will be 13s. 8½d. per acre, or £276 3s. 4d., including wages and keep for the working period, on one average crop of wheat. Summary.—Fence depreciation, £10; implements depreciation, £24 10s.; rent and taxes, £4 3s. 4d.; seed, £45; super., £50; sacks, £33 6s. 6d.; cartage, £33 6s. 6d.; twine, 12s. 6d.; wages, £61 8s.; hay, £52 10s.; scrub interest, £11 5s.; a total of £326 1s. 10d." Mr. Riddle thought the amount of hay allowed for horsefeed insufficient. The Hon. Secretary thought depreciation in the value of horses should be taken into account. The rearing of foals was a separate line, and not a necessity in the production of a wheat crop. He considered £3 per head per annum a fair amount for depreciation.

Goode, June 19.

(Average annual rainfall, 12in. to 13in.)

Present.—Messrs. D. J. Tonkin (chair), J. G. Nicholls, N. Packer, L. B. Hughes, A. B. Gue, S. O. McPherson, W. Burner (Hon. Sec.), and two visitors.

Rabbit Destruction.—This subject was discussed at length. The Hon. Secretary said that successful results had attended the following method tried at Denial Bay:—A jam tin, half filled with water, into which was placed a small piece of phosphorus, a little bisulphide of carbon, and then a little rock carbide was quickly thrust into a burrow, which was immediately closed. Following the evaporation of the water, the phosphorus fired in the burrow. Mr. Hughes had secured good results from the use of raspberry jam and strychnine. The Hon. Secretary drew attention to the possibility of the loss of stock through their eating the bones of rabbits destroyed in this way.

Mangalo, June 21.

(Average annual rainfall, 14in. to 15in)

Present—Messrs J C. Busch (chair), W. E. Waters, C. H. Klingberg, J. W. Deer, H. H. Klingberg, J Meiglich, A. Schiller, H. Mackley, jun, J H. Cleave (Hon. Sec.).

Mallee-Farming.—Mr. W E. Waters contributed a paper on this subject, in which he stated that farmers should work systematically. It was essential in new country to secure a good stack of hay and a good supply of water. All rubbish should be cleared off the land before ploughing was commenced. Stubble should be burnt in the hot weather, as many of the mallee shoots would then be killed. New land should be ploughed as early as possible to enable the sun and rain to sweeten it. Stubble and grass land should be ploughed after rain, as there was then more chance of the weeds being killed Cropping should be completed by the end of June to allow time for the preparation of the soil for the following season Mallee shoots should be cut at the first opportunity. As much of the fallowing as possible should be done immediately after seeding, in order to get the benefit of the winter's rain. One acre of well-worked fallow land was worth three acres of land not so treated. Members generally approved of the ideas expressed by the writer of the paper, and agreed that it was necessary to cut mallee shoots early.

Miltalie, June 14.

(Average annual rainfall, 14·55in.)

Present.—Messrs. P. G. Wilson (chair), J. R., J. W., and E. Story, J. R. Hill, S. R. Searle, W. G. Smith, J. S. Jacobs, C. and A. Degner, A. M. and T. A. Wilson (Hon. Sec.), and four visitors.

Fallowing.—Mr. Hill read a paper in which he stated that farmers were slow to recognise the value of well-worked early fallow. Some even did not commence ploughing until the spring, and kept on till the hay harvest. Weeds were allowed to grow, and an attempt was made to feed these off with sheep, cattle, or horses, the plough again turning the land right back at seeding time. The drill followed close behind this, and the crop was left to take its chance, which was a very poor one. The plan he recommended was to commence fallowing the day following the completion of seeding, ploughing the ground well with a good plough, and turning the weeds well under. The fallowing should be completed by the end of August, and should be harrowed once crossways to secure a good tilth. During the latter part of September the scarifier should be put in. If mallee shoots were troublesome a disc implement should be used, and the scarifier harrows previous to harvest time. Sheep could be run on the land until March, and it should then be again cultivated to secure the full benefit of the early rain. The scarifier harrows should after this be kept going until seeding time. Members generally agreed with the ideas of the writer of the paper. Fallowing should be commenced early, although frequently the soil was found to be too hard. The Chairman suggested that if the land to be fallowed were scarified or disked in February, it could be worked early in June or July.

Miltalie, July 18.

(Average annual rainfall, 14·55in.)

Present.—Messrs. T. A. Wilson (chair), I. R. Hill, H. Brine, I. W. and J. P. Story, M. H. Wilson, E. Story (Hon. Sec.), and four visitors.

The Social Side of a Farmer's Life.—In a paper on this subject Mr. J. W. Story urged that is was a mistake even for the older farmers to entirely cut themselves off from sport, while to keep young people at work from daylight to dark, six days a week, would dwarf the intellect and generate an uncongenial spirit. While recognising that during such times as seeding and harvest pleasure had to give way to long hours of work, the rural men, as a class, would do well to cultivate the social side of life. It was wise to take an occasional half-day off. A Bureau social evening occasionally would be of value. Visitation among farmers should be extended, for, apart from the social element, one could always learn something from his fellow farmer. In the discussion, Mr. Wilson thought sport was an essential element in young life, provided that one worked hard during working hours. The Chairman emphasized the need for farmers to extend their reading, while Mr. Hill thought such sport as Bureau conferences, homestead meetings, field trials, &c., were more in the farmers' line than football and similar pastimes.

Penong, July 12.

(Average annual rainfall, 11·93in.)

PRESENT.—Messrs. W. Saunders (chair), A. Shipard, W. B. Prider, and J. Oats (Hon. Sec.).

CONSERVATION OF FODDER.—Mr. A. Shipard read a paper, in which he urged the wisdom of making better provision in times of plenty to supply a sufficiency of stock feed in bad seasons. Even inferior cocky chaff and good straw should be put by, though the expenditure of a few pounds was sometimes involved in the work. A few sheets of galvanized iron would preserve such reserve supplies for a number of years, and one never knew when it would become very valuable indeed. Mr. Farrelly agreed that a great deal of feed was wasted every year in this district. Bran and cocky chaff made very good stock feed, and every farmer should have a stack of straw. The Hon. Secretary and the Chairman pointed out that the heavy rains in February last damaged so much wheat chaff that it was useless to attempt to preserve it.

Roberts and Verran, July 16.

PRESENT.—Messrs. R. Johnson (chair), A. T. Cowley, F. Masters, E. Phillips, H. Ede, H Sharman, J. H. Buttfield, F. Imhoff, W. Sharman (Hon. Sec.), and eight visitors.

FALLOWING.—In a paper on this subject, Mr. A. T. Cowley said there was little to be gained by fallowing land in this district the first year after clearing. The scrub fire would tend to sweeten and enrich it to a certain depth ; it should be worked to this depth, and then drilled. This practice also saved considerable expense that was involved in clearing when fallowing was carried out. This could be best commenced after two or three successive crops had been taken off. Continuing, the paper read—"The object is to produce, or at least to prepare, sufficient nourishment in the soil to feed and sustain a profitable crop, and to keep that nutriment in the soil until the crop is ready to make use of it. We may as well take into consideration at the outset the fact that it is impossible to grow a blade of wheat from earth alone, however rich that earth may be in 'food' qualities. In fact, earth is not plant food until converted into it through the agency of other 'elements.' Only a very small percentage of the soil laid open to treatment can be thus converted in any one year. The greater that percentage, the 'richer' the land. We have to deal, then, not only with the soil itself, but with the action upon it of light, heat, cold, rain, dew, frost, gases, chemicals, and air. The man who knows best how to work his land to obtain certain results is the man who knows most about the way in which these elements work in the soil and the conditions under which they work best. There is a time to plough, and I believe the best time is early—commencing in June or as soon after as possible. There is a correct depth to which to plough and which varies according to the quality and general condition of the soil, and also, in some degree, according to whether we desire to pull out stumps or leave them in the ground. When ploughing deep, plough the land early and afterwards work lightly as many times as possible between fallowing and seeding to give time and opportunity for the action of air and moisture upon the soil disturbed. The best condition in which to plough or work the soil is when it is charged with moisture—to what degree depends upon the nature of the land. Some ground in this locality never gets too wet to work, other ground may. Some never gets too hard to work when dry, but in my opinion the preparation of plant food is not promoted to the same degree in dry working as in wet, and there is, I believe, something more than an imaginary risk of encouraging takeall germs in a loose-natured soil by dry ploughing. The conservation of moisture, in this district, is quite as important a consideration as the production of plant food. Food without water is as useless to a plant as it is to man or beast, and we must be as much in earnest about getting the rain into the soil when it falls, and keeping it there, as we are about getting it into our tanks and holding it for future use. The best way to get it in is to have the soil open, loose, and free to receive it. Keeping it in depends upon the top and bottom conditions of the soil. Where the subsoil is clay it may safely be encouraged to go down as deeply as possible. It cannot escape below so is safer away from the surface. Where a limestone or other class of rubble subsoil forms a natural deep drainage system the working should be of a nature calculated to keep the moisture near the surface, and it is in such a case that what is as nearly as possible a non-evaporative surface should be maintained. A solid bottom must be left unbroken between the ploughing and the rubble below; this, provided the soil may be loosened as deeply as thought desirable, to absorb, if possible, all the moisture that comes upon it. Succeeding workings should deal with the surface only, and should occur, if possible, whenever a sufficient quantity of rain falls to give the surface any inclination to 'set' or become firm; the object being to keep the surface so open and loose that the moisture receives no encouragement to permeate the extreme top 'layer' of soil. Thus it is shaded by this light layer from the sun's rays and sheltered from the wind—the two great evaporating agencies—and the loss is reduced to a minimum. At the same time the surface of the soil itself is open to the beneficial effects of sun and air. Fallowing, I believe, is directly and indirectly the most effective method of destroying undesirable plants such as mallee shoots, shrubs, and noxious weeds. Every working of the land destroys young plants and encourages the germination of remaining seeds to meet a similar fate later on. Any shrubs that have not been torn up in the first ploughing receive considerable damage, and few will survive by the time the crop is sown. A few shoots are torn off the stumps each time, and the stumps themselves are bruised and shaken, which soon begins to tell on their health, especially if the fallow has in the first place been ploughed deeply enough to tear up the strong feeding roots running 4in. or 5in. below the surface of the soil. After being subjected to rough treatment on several occasions during the eight or nine months of fallow working there will be considerably fewer shoots for the 'slasher' to deal with after the crop is drilled in, and if, just when a fresh growth, young and tender, is making yet another struggle for existence, a good stubble fire is obtained (which should follow as one of the benefits of fallowing) there will be probably not more than two or three stumps to the acre left alive to produce another crop of 'shoots.' I cannot claim to have proved this yet by experience on fallow, but I have 35 acres on which in two years from the time it was cleared the stumps were practically all killed with plough and fire. On my first fallow here, this year, I have seen the thinning out process, and am satisfied that if a stubble fire is obtained after harvest there will be few, if any, shoots to grow again. I fully believe that the threefold purpose outlined here can be served by fallowing, and that the productiveness of this country will be demonstrated, and that to our profit, when we have established a thorough system of fallowing." Mr. E. Phillips would use a small plough for fallowing, and so pull out stumps; he favored deep ploughing. Mr. Masters thought ploughing to a depth of from 2½in. to 3in. sufficient for this district. The Hon. Secretary thought the disc plough more satisfactory than the share for destroying shoots. The majority of members favored early fallowing to a depth of about 3in.

Utera Plains, June 21.

(Average annual rainfall, 12·06in.)

PRESENT.—Messrs. Sinclair (chair), J. and M. Abrook, H., T., and G. Hornhardt, Venning, Hier, Gale, Stephens, Lee, H. and G. Barber, Warnes, Guidera, A. Ramsey, (Hon. Sec.), and 50 visitors.

POULTRY.—Mr. W. Hier read a paper in which he said that, generally speaking, there was room for improvement in the methods of keeping poultry adopted in this district. The quality of the birds, and not their numbers, should be the chief consideration. They would do best on farms possessing low scrub in which they could find shelter. A good style of nest, which would not be easily found by crows, was made by digging small holes in the ground, and over these placing "dugouts," leaving just sufficient room for the hens to pass in or out. Care should be taken to place them out of danger of flooding. The erection of scarecrows was also frequently effective. Turkeys could be kept with advantage on some farms, but plenty of room was necessary. A turkey hen was a first-class mother for young chickens, but she should be confined in a fairly large yard. A flock of these birds could be built up by securing three or four young hens and a two-year-old cock, unrelated to the hens. Another gobbler should be secured after two years if it was desired to breed from the stock bred on the farm. Ducks and geese would do well on farms through which there were running streams, but otherwise they would not pay. The same care should be taken with breeding as with turkeys. The best time for extensive breeding in this district was July and August, but chicks could be reared all the year round where sufficient shelter was available. Old hens should be fattened for the table. Generally they should be killed off after the second season. When feeding turkeys or hens, the grain should be scattered on soft earth. Wheat for ducks should be put into water or in small heaps on the ground. Constant activity was essential to the health of all poultry. Ashes and lime should always be available. Laying ducks should be yarded at night.

Yabmana, July 12.

(Average annual rainfall, 15·14in)

PRESENT.—Messrs. M. K. Frost (chair), F. A. and H. Beinke, J. F. and A. Robertson, J. G. Pengelley, W. Schirmier, G. W. Story, J. N. and A. D. McCallum, H. P. McCallum (Hon. Sec.), and three visitors.

SHEEP ON THE FARM.—Mr. J. G. Pengelley, in a paper on this subject, advised farmers to go in for sheep, even if only a few were kept. They would be found very effective in keeping down weeds on the fallow, but they should not be put on this until cattle and horses had been run on it. Although they might not be fattening, the value of their wool was increasing. Old sheep should not be purchased, as they seldom did well, and the wool was short and sticky. For the farmer who went in for breeding on a small scale, the crossbred would be found more profitable than the Merino, the Lincoln-Merino cross mated with a Shropshire ram being most suitable for this district. The lambs were larger, and matured earlier than those of the Merino. The mothers were quieter, and generally suffered less on account of the shortage of feed in the event of a late season. These advantages more than counterbalanced the greater wool value of the Merino. Mr. J. N. McMcCallum preferred the Merino, on account of the difficulty with the crossbreds getting through the fences; the wool also was better. Mr. F. A. Bienke's flock of crossbreds last year cut an average fleece of 10lbs. These were best in a district such as this where meat was difficult to procure. Messrs. G. W. Story and J. F. Robertson preferred the Merino, as the skin and wool were more valuable. As a butcher's sheep, however, the crossbred was best. Whilst there was a possibility of the mutton market being over supplied, the Chairman said there was very little likelihood of the wool market becoming glutted. Members generally favored the Lincoln-Merino as the best cross.

Yallunda, June 21.

(Average annual rainfall, 18in. to 19in.)

PRESENT—Messrs. H. P. Cabot (chair), W P. Cabot, J. S. Perry, A. Cabot, G. A. Teakle, A. V. Teakle, A. G. Price (Hon. Sec.), and four visitors.

FALLOWING.—In a paper on this subject, the Hon. Secretary stated that the absence of fallow land in this district in the past was due to an insufficient area of cleared land, and the necessity for giving time to such work as fencing and clearing. Well-worked fallow enabled the farmer to make an earlier and better start at seed time, and the productiveness of the soil was increased. The best system of working was to have the land under fallow one year, under crop the second, and under grass the third year. Where the holdings were not large enough to allow of this, it was necessary to fallow the stubble. The soils in this district, if well worked, should produce a payable crop every second year, as there was a heavy rainfall and it was practically new land He would commence fallowing about the 1st of August. The share plough was preferable to a disc implement. It was advisable to work as much as possible with the plough, turning the furrow down hill Generally, the soil should be turned to a depth of 4in. or 5in., and the ploughing should be completed by the end of September. Numerous weeds would probably appear in October, which would necessitate reworking with a lighter implement Except where there was rubbish, such as roots, on the land, a cultivator of 15 or 17 tines, cutting a width of 7ft. or 8ft., would be found light work for the plough team, but where the weeds had made strong growth the skim plough would be most serviceable It was advisable to cultivate to the full depth of ploughing, as the soil was liable to set down hard. After the rains in February and March, he would work the ground to a depth of 4in. At seed time a light spring-tooth or similar implement which could be worked with four or five horses could be put over the fallow, and the drill could follow this. He did not favor harrowing, except in cases where land had been lying out for a number of years, when it would usually break up roughly in the ploughing. With an average season he advised sowing wheat on the fallow. Too early sowing, however, involved the risk of the seed malting. The balance of the land could be sown to oats or barley. For the past three years he had secured good results of hay from stubble land, ploughed with the February or March rains and sown to oats at the end of April. It would not be long before fallow paddocks were as much in evidence in the new as in the older districts. Members generally agreed with the ideas expressed by the writer of the paper.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Berri, July 12.

Present —Messrs. W. F. Clayer (chair), A. P. Wishart, F. Arndt, J. McGilton, W. Powell, A. Stahling, S. Phillips, V. Fowler, W. Fiedler, R. Koska, R. W. McCreanor, C. H. Virgo, W. Napier, S. Guernsay, T. L. Hughes, M. Mahoney, C. Harris, E. G. Mitton, E. Day, and W. R. Lewis (Hon. Sec.).

Experimental Horticulture on Murray River Reclaimed Areas.—The following paper was read by Mr. F. Arndt: —"Now that the South Australian Government has embarked upon an extensive scheme of irrigation works, with Berri and Waikerie partly completed, and with such large areas as Cobdogla and Ral Ral soon to be started, the question naturally arises to what uses are these lands to be put. So far, the only product of the irrigation areas along the Upper Murray valley has been fruit, which has been disposed of either in the fresh or dried state. It is, however, the dried fruits industry that has been the making of the Murray irrigation settlements, as the export of fresh fruit to other districts of the Commonwealth has been but small in comparison. But profitable as the dried fruits industry has undoubtedly been, both leading growers and merchants have issued a solemn warning that certain lines have reached the limits of Australian consumption, and that others will soon follow. This is the case with currants and raisins, and there is no hope of successfully competing with the Mediterranean product in the markets of Europe. The Sultana also is in danger of being overdone, for although the higher grades found a ready market in the older countries, to successfully compete with the output from the Levant it would be necessary for the Australian grower to be satisfied with a much lower price for his article than he has secured hitherto. Dried apricots have for some time been produced in sufficient quantity to supply the local demand, but there is said to be a demand arising for them in England. There seems to be an increasing local demand for dried peaches, but owing to Californian competition there does not appear much hope for the Australian grower to dispose of this product profitably on the London market. This, then, being the position of the dried fruits industry in Australia to-day, it is obvious that if the bulk of the area which the Government intends to bring under irrigation, whereby the irrigable area of South Australia will be trebled, is given over to the production of dried fruits, there will be such an over-production that the whole industry will be seriously disorganised, if not ruined. Therefore it is absolutely necessary that the greater portion of the new irrigation areas should be set aside for the production of other horticultural or agricultural produce than that already being produced. For this reason it is clearly the duty of the Government to insure the financial success of their irrigation enterprises—that the lands are planted with crops that yield a living to their occupiers. What new lines of agricultural produce may be profitably grown has not yet been determined. A lot of experimental work will be necessary before the success of any new line of agricultural activity has been fully demonstrated, and here is surely a splendid opportunity for the Government. It was no doubt for some such reasons as these that the Government three years ago set aside 70 acres of the best irrigable land at Berri; but far from being an experimental station wherein the suitability of new types of trees and plants to the district was being demonstrated, the experimental farm has only been one such in name. The greater portion of the farm has now been planted with oranges, vines, peaches, apricots, and lucerne, varieties of plants that experience has long ago proved can be successfllv grown along the river, the only thing pertaining of the nature of an experiment being a patch of a few hundred Smyrna figs. In fact, the farm has been laid out on the same principles as a commercial orchard, and when its many acres of fruit trees and vines come into bearing, will become a competitor with the settlers in the markets of the State A statement was made some time ago by one of the officials of the farm that the farm was not so much concerned with the testing of new varieties of plants to the conditions of the district as with manurial and irrigation tests. Surely this was but an excuse to disarm criticism, for have not the experience of Renmark, Lyrup, and other river settlements long ago successfully solved these problems? It is not to be denied that all the trees and vines planted in the farm are looking exceedingly well, and that new settlers without local experience may learn a great deal about the culture of trees known to succeed in the district; but a walk through an up-to-date orchard at Renmark or Lyrup would prove equally instructive. If a small area of land, say 10 acres, had been set aside and planted with trees of proved varieties as an object lesson to new settlers, the remainder of the farm being given over to horticultural and agricultural experiments, the ideal would no doubt have been reached, and the farm would then have been in fact as well as in name an experimental farm. After due consideration I have come to the conclusion that there are certain varieties of trees and plants which would perhaps prove suitable for growth under conditions existing on the river, and which could with advantage be experimented upon at Berri. The following varieties I believe are worthy of a trial:—Firstly, vines. The culture of currants, Sultanas, and Gordos has long passed the experimental stage, but now that grapes are selling at such high prices for wine and distilling purposes, I believe it would not be amiss if a few acres on the farm, both on the sandy rise and the harder flat land, were set apart, as far as the river is concerned, for the comparatively untried Doradilla, which is so well known for its productiveness in other parts of the State. Although the culture of the apricot and the peach has long passed the experimental stage, the same can hardly be said about the nectarine. The early common varieties, such as Cardinal, Fairchild's White, &c., are not ideal nectarines for drying, but Goldmine and Stanwich have been found to be excellent for that purpose wherever they have been tried. Two new varieties, Victoria, said to be similar to Stanwich, but maturing a month earlier, and Zelandia, said to be an improvement on Goldmine, should, with Goldmine and Stanwich, be given a trial. Turning to the the apple, it may perhaps be thought that as the Commonwealth annually exports about 1,000,000 cases to Europe, the market for this fruit is glutted, and that it would be useless to plant more. So far as early and late varieties are concerned, this is no doubt true, but if it could be proved that along the Murray valley such mid-season and early-export sorts as Ribston Pippin, Cox's Orange Pippin, Jonathan, and Dunn's Seedling would ripen two or three weeks earlier than they do in other parts of the State, then they would arrive in the London market when it was comparatively empty, and consequently realise satisfactory prices. Pears have long been grown with profit, but if such varieties as Beurre Bosc, Beurre Clairgeau, Poire de Berrioy's, and Winter Bartlett, which have proved such good croppers in other places, were given a place on the farm, they would perhaps prove themselves suitable to the district. Although it would be wise to test the different varieties of pears and apples both on the loose and harder land, it is probable that with good cultivation they would in the end give the best results on the stiffer land. Of all dried fruits the prune is most largely consumed. California boasts of over 10,000,000 prune trees, while the number that is grown in France and Italy is also very great. In Australia, however, the prune is not grown to the extent one would expect, and large quantities are imported every year. So far prune-growing has not proved a commercial success on the irrigation settlements along the Murray valley; but the fact that small groups of trees here and there bear regularly and well shows that their successful culture here is not impossible, but rather that the treatment they have received has not been suited to their requirements. Here, then, is a fit subject for experiment on the Berri Experimental Farm, and a few acres should certainly be tried. The varieties most commonly grown in California are Prune D'Agen, Fellenburg, Robe de Sargent, Sugar Prune, and Tragedy, and these varieties, with perhaps a few others, are worthy of a trial. One of the most profitable trees grown in California is the walnut, and last year the crop exceeded 8,000 tons. The common English walnut has been quite discarded in California, and has been superseded by French and local varieties. All varieties are grafted on to the Californian black variety, which makes the hardiest stock. It is claimed that grafted walnuts of good variety will yield a payable crop in five years, while unworked trees take twice that time. As the climate of California has many points of similarity with that of South Australia, and as the walnut finds a ready sale in the markets of the world, it would not be out of place to give it a trial at the experimental farm. The following varieties are said to do well in the hotter parts of California, and would perhaps do well here:— Franquette, Placentia Perfection, Eureka, and Neff's Prolific. Closely allied to the walnut is the pecan nut. The pecan thrives and produces fine crops of nuts in all localities throughout California, except near the sea coast, where, on account of fog and cool breezes, it is rather late in ripening. As with the walnut, only grafted varieties of good quality are worth growing, seedlings giving nuts of inferior quality. The most profitable varieties in California are the paper shell sorts, such as Stuart, Frotscher, Russell, and Success, and nuts of these varieties are at present selling at from 1s. 6d. to 2s. per pound in the United States. As the pecan thrives best in a hot climate, and as grafted trees are said to yield paying crops in six years, it should prove a fit subject for experiment. Another fruit that is at present booming in California is the avocado, or alligator pear, a subtropical pear-shaped fruit, said to be the best of fruits for salads. So great is the demand for this tree that Californian nurserymen are asking as much as £1 per tree for budded varieties. The best variety, which is said to be exceptionally hardy for a subtropical tree, is Harman, but whether it would survive the severe frosts of the Murray valley experiment only could tell. The tobacco plant should be given a trial in our experimental farm. Considering that tobacco of excellent quality was grown at Lyrup in the early days of that settlement, there appears no reason that it should not be grown now on other irrigated districts along the Murray. Many years ago I grew tobacco for a few seasons on a sandy flat in the Adelaide hills, and I feel certain that with proper culture such a variety as Havannah would do well on the red sandy slopes of Berri. As it gives an immediate return, it would no doubt prove a paying crop if 1s. per pound for good cured leaf could be realised. Many other plants are worthy of experiment— such as rice, which is now profitably grown under irrigation in California, and there are others with which I am not acquainted. So far the occupiers of irrigable land along the Murray have not taken kindly to dairying, and there seems little likelihood of its becoming very popular in the near future. Everywhere, both on the old and in the new settlements, more and more land is being planted to orchards. It behoves the Government to carry on a policy of vigorous horticultural experiments on irrigated land set aside for that purpose, and test the suitability of new varieties of plants and trees to the conditions of the river districts. If, after a series of thorough tests, it is demonstrated that certain varieties can be profitably grown under irrigation, the new lands, as they become ready for planting, could be largely planted with those varieties. This would relieve the pressure of competition from the older settlements, as well as assuring the success of the new, and give to irrigationists the assurance of a sure living." The paper was well received and discussed by Messrs. Stahling, Lewis, Phillips, Wishart, and Hughes, and on the motion of Mr. Phillips, seconded by Mr. Koska, the following resolution was unanimously carried:—"That the attention of the Minister of Agriculture be drawn to Mr. Arndt's paper, and that the Berri Branch of the Agricultural Bureau is fully in accord with the sentiment of the same."

Clanfield, July 25.

(Average annual rainfall, 16in. to 17in.)

Present.—Messrs. W. Paull (chair), A. Orwell, P. Nelson, A. Correll, L. Orwell, C. Paull, H. Milne (Hon. Sec.), and three visitors.

Farming on Sandy Land.—Mr. A. Correll read a paper on this subject. He favored the tine cultivator for the first two seasons, as that implement broke more roots and pulled up more small bush than the disc. He would fallow after the shoots were well in hand, and would increase in the dressings of super. In the discussion that followed, members favored deeper sowing in the sand in dry seasons, as the surface of the sand soon dried. Mr. Paull favored fallowing the sandhills, his fallowed hill was quite wet now, although the season had been so dry. Some members favored the disc plough for working, as it cut so many shoots and worked the ground equally as well as the tine.

Claypan Bore, July 17.

(Average annual rainfall, 16in. to 17in.)

PRESENT.—Messrs. J. Gray (chair), S. Gray, H. Colwill, E. Colwill, D. McCormack J. Webb, J. Entwhistle, F. S. Tall (Hon. Sec.).

FENCING IN MALLEE DISTRICTS.—Mr. D McCormack read a paper on this subject. In this new country, he said, a great deal of fencing would have to be done. As a result of considerable experience, he had come to the conclusion that for utility and value a fence with few wooden posts had many advantages. In the North he had put up a sheep-proof fence 12 years ago, and it was as good to-day No. 10 galvanized wires were used, wooden strainers, and tee iron posts 4ft. 6in. long and 9ft. apart. He recommended two barbs and four plain wires, allowing 11in. between the two top wires and 7in. between the second barbed wire and the first plain one, with 6in. between those below. Strainer posts were put seven chains apart, and the height of the fence was about 3ft. 4in. In this district such a fence would be specially suitable, because only the strainers could burn. Doubtless the boundary fence would have to be made rabbit-proof. In the discussion which followed, Mr. Entwhistle recommended the use of more wooden posts to resist damage by stock. He had put these every chain with three iron droppers between. Mr. Gray would put strong gum strainers every 10 chains and 1¼in. by $\frac{3}{16}$in. tee standards every 9ft., using six wires, the top two 11in. apart, the next 8in. below, then 6in. and 5in. between the others. This would prevent the lambs breaking through.

RABBIT PEST.—A large number of methods for dealing with rabbits were discussed, and frequent use of the poison cart during the summer months advocated. Mr. McCormack considered that many methods of dealing with the rabbits were good, and advised members not to confine themselves to one means. Mr. Entwhistle strongly recommended fumigating. He had seen burrows where the rabbits had been completely destroyed by this method carried out in a thorough and systematic manner.

Coomandook July 12.

PRESENT.—Messrs. W. Ninnis (chair), A. S. and J Chapman, L. A., R. A, A., and R. B. Williams, M. P. Wilkin, E. A. Luxmore, W. W. Brown, C. E. W. Hillman, H. C. Hughes, O. J. A. Blucher, W. T. Legalley, C. M. Wilkin (Hon. Sec.), and six visitors.

FALLOWING —The following paper was read by Mr. O. J. H. Blucher :—" Fallowing is one of the most important matters connected with farming, but more so in the older districts than in the newly-opened mallee country. I am somewhat doubtful if fallowing new mallee land will pay directly, but indirectly undoubtedly it will, for one can get a larger area under crop in reasonable time. By burning or fire raking the stubble, followed by skim ploughing or cultivating, and a light dressing of super. and seed, probably a second crop can be secured equal, if not better, than that from fallow land. A great deal of labor will also be saved, which is no small item at the present. One disadvantage of fallowing is that the mallee shoots get an extra 12 months' growth without a check, which means extra work and expense, besides giving the mallee a chance to recover from previous fires and ploughing, especially if the stubble was not burnt the previous year But it will pay to go to a good deal of expense to fire rake the stubble before fallowing, and when done as early in the summer as possible, this will check the shoots, sweeten the soil, and kill a fair percentage of mallee altogether Fallowing should begin as early after seeding as possible, when the ground is in a wet state, and to get the benefit of all the winter rains it should be finished by the end of August, if possible. Land ploughed in spring is apt to be very loose, which encourages takeall. A share S. J. plough cutting a furrow of from 8in. to 9in. is the best implement, unless the ground is too sandy or stony, when the disc plough will probably do better work A depth of from 3in. to 3½in should be quite enough for this district. All the shares should cut to an even depth. If they are worn too much they are likely to leave a strip of ground unbroken in firm land. In this district, where the ground is naturally loose and fine, it can with advantage be left in a rough state till the early spring, when it should be cultivated or cross ploughed with a skim plough with mouldboards removed as shallow as possible. This results in a firm bottom with a loose mulch on top, which retards evaporation. If time and weather permit it is advisable to harrow again before harvest, or any time during the summer after a rain. This helps to a great extent to conserve the moisture, which is one of the main factors in fallowing. Before sowing, the land should be again cultivated, after a rain if possible, drilled, and then harrowed." Members generally favored fallowing to a depth of from 3in. to 3½in. It was advisable to turn the fallow back with a skim plough, which pulled out stumps loosened by the plough and assisted in the retention of the moisture.

Coonalpyn, June 13.

(Average annual rainfall, 17·49in.)

PRESENT.—Messrs. Wall (chair), Venning (two), Bone, Samuel, A. Fidge, Pitman, Cronin, J. Hill, J Flint (Hon. Sec.), and four visitors.

PLOUGHS.—Mr. G. E. Venning read a paper. The specific function of the share plough, he said, was to turn the soil, and it was well to bear this in mind. The work could not be well done if the beams were bent, the ploughs strained, or the shares blunt, or badly set on the foot on account of a bad mould or a false stump not being properly fitted in the socket. The old weight pressure stump-jump plough was better than the bridle draught implement, as the former was easier on the horses, and wear and tear was not so great. Small ploughs did better work than large. A four-furrow implement was best. The disc cultivator was good for use where there was rubbish to contend with. The farmer with limited capital starting in scrub land was advised to procure a disc cultivator for working his land for the first two years. After this a four-furrow share plough should be used on the land, whether it was for fallow or crop. Nothing but the best make should be purchased.

PIGS.—Mr. H. Bone dealt with this subject in a short paper. While pigs would exist on practically any offal, he said, they would not do well unless they were well and carefully fed. The progeny of a Tamworth sow crossed with a Berkshire boar would be found most profitable. The Tamworth grew to a good size, was fairly hardy, and a good bacon pig, and the Berkshire was a good doer and grew fast. Proper care and attention were essential

Forster, June 14.

(Average annual rainfall, 10in. to 11in.)

PRESENT.—Messrs. C. Hayman (chair), W. J. and T. Searle, J., F., and W. Johns, J. G. Whitfield, P. Purdee, T. and G. Retallack, C. P. Payne, E. Towill, W. Sears (Hon. Sec.), and four visitors.

HANDLING FARM HORSES.—Mr. W. Searles read a paper in which he said care and attention given horses from the time of foaling until breaking was amply repaid. Colts should be weaned at six months of age, and if they were tied up, it would be found that they were much quieter when being broken in. For breaking he advised the use of a crush pen. After the animal had been roped, the winkers should be put on. A piece of white cloth on a stick should be rubbed over the neck and ears of the beast if trouble were experienced, the winkers being worked up the neck and down over the ears. When an attempt was made to put them up over the horse's nose, there was a danger of the operator being struck with its front feet. A plough rein should be attached to each ring of the bit, and after the animal had been driven for about an hour the harness should be put on, particular care being taken to see that the collar fitted. When harnessed, it should be placed in the shafts of a waggon alongside a steady, reliable horse, capable of drawing the load by itself. The best age for breaking was three years, but the horses should not be worked for more than half a day at a time for the first 12 months.

FENCING.—Mr. J. G. Whitfield gave the following specification for a fence :—Posts, pine, cut green, barked, and seasoned for about 12 months, not less than 4in. in diameter at small end, and placed 18in. in the ground, 10ft. apart. Top wire 3ft. 10in. from ground, second 2ft. 9in., and bottom 1ft. 9in. The centre wire would then be of correct height to carry 3ft. wire netting. Members generally preferred the white mallee for posts.

Forster, July 19.

(Average annual rainfall, 10in. to 11in.)

PRESENT.—Messrs. W. G. Retallack (chair), W. J. Sears, C. Payne, C. Hayman, J. Stone, T. and W. C. Retallack, J. Searle, R. Whitfield, T. Searle, G. Searle, J. Johns, C. Payne (Hon. Sec.), and three visitors.

AGRICULTURAL LABOR.—Mr. T. Searle read a paper in which he stated that a farmer holding 1,000 acres, with 500 acres cleared, and possessing a five-horse team and the necessary implements, could keep two men employed. He could deal with between 230 and 240 acres with the team mentioned. Of this, 20 acres would be required for hay, and 20 acres sown to oats for feed, leaving 200 acres for wheat, which, on an average yield of 8bush., should return 530 bags, worth £260. Seed, super., &c., would involve £70, which left a balance of £190 to pay wages, which amounted to £90 per year per man, and recompense the farmer. He would be better off if he put in 180 acres himself, which, after deducting the area necessary for providing horsefeed, would return wheat valued at £185. Taking the cost of seed and super., £60, from this, left £125. It might be necessary to employ a man for one week at hay-carting and two weeks at wheat-cleaning, which at £2 per week would mean a further expense of £6, but there was still a balance of £20 in favor of cropping the smaller area. During the past two seasons the average yield had been less than 8bush., consequently the farmer's return was somewhat lower than that given above. Mr. W. J. Sears thought much of the work on a 1,000 acre farm would be neglected unless the farmer employed a man. Mr. C. Hayman also thought it would pay the farmer to employ labor. Messrs. J. Johns, C. Payne, and W. G. Retallack agreed with the paper, and thought that it would pay a small farmer better to put in less crop than to employ men at high rates of wages.

FARM GARDENS.—Mr. C. Payne read an article on this subject from the *Journal of Agriculture.* He had successfully grown vegetables with bore water, especially tomatoes and melons. Mr. W. Searle thought it better for the farmer to purchase vegetables than to try to grow them. Mr. J. Johns found that where bore water was used on cabbages they were affected with blight. Mr. J. Searle had successfully grown pumpkins under old rotten chaff heaps without water. Many vegetables and fruits of good quality had been produced on his farm.

Hooper, July 11.

(Average annual rainfall 14in. to 15in.)

PRESENT.—Messrs. J. R. Beck (chair), C. B. R. Wright, E. G. Colton, G. G. Pitt, A. W. Lawrie, R. J. Chenoweth, J. Boyce, W. Boyce, W. Sweetmann, C. S. Hall (Hon. Sec.), and three visitors.

FARM IMPLEMENTS.—The following paper was read by Mr. Wright:—"The success of a farmer depends largely upon his wisdom in selecting and the care he takes in protecting his implements. When purchasing he should not depend too much on hearsay. An implement that gives satisfaction on one class of land may be useless on another; and one that is good on fairly clean land will not always work successfully where the stumps are prominent or sometimes even where it is hilly. Farmers should avail themselves of the opportunity of getting an insight into machinery at the agricultural shows and field trials, especially the latter, as they can there be seen to better advantage. An unsuitable implement is not only waste of capital, but often the cause of a considerable waste of time at most inconvenient periods. For the protection of implements it is essential to keep them under cover, as the varying conditions of weather have a very bad effect upon them. If implements constructed of steel are left out, the paint will soon crumble off and allow the steel to rust. The nuts will not only become set on the bolts, but the threads will rust and be rendered weak. When one has finished working a machine for the season all the old grease which has been allowed to accumulate should be removed while it is soft, and a coat of blacklead is very beneficial to wearing parts. Note should be taken of any necessary repairs or missing parts, so that one's time is not wasted when one wishes to work the implement again. All implements constructed of wood when put away in the shed should have a good coat of boiled linseed oil rubbed into them. This will not only preserve the wood, but will make it much easier to paint. This can be done in a very short time, and it is surprising what a little oil is required. When taking a machine out again give it a good coat of paint. This will protect it from the weather while the machine is in use. This is especially necessary with harvesters. They are constructed with a good deal of light wood, and unless kept oiled and painted frequently the dampness will cause the wood to swell and warp. Do not buy paint ready mixed in 2lb. tins; this will prove too expensive. Procure white lead in 56lb. drums and the oil in 5gall. drums, get the colors, and mix the paints. This will be much cheaper, and in my opinion a better paint. To preserve the oil keep it airtight. The white lead will keep for any length of time if it has 2in. of water on it."

Lameroo, June 21.

(Average annual rainfall, 16·55in.)

Present.—Messrs E. J. Trowbridge (chair), O'Connor, Jas and K. Cameron, F. W. Eime, Marshall, Lehman, Leckie, Wray, C. R. Eime, Ross, Thyer, Koch (Hon. Sec.), and one visitor.

Fodder Crops.—Mr. Marshall read a paper on this subject. For growing hay he recommended the selection of a piece of rich flat land, which should be well ploughed in July or August. It should be harrowed to a fine tilth, and cultivated and harrowed several times during summer. A good tine cultivator should be put over it during the following season, and 2bush. brown Partridge peas and 100lbs. of super. per acre drilled in as deep as possible, together with 1lb. of lucerne seed, which would develop a fairly strong growth by the time the land was again left out for pasture. A yield of 20bush. per acre could reasonably be expected from the peas. The cost of the seed, 2bush. at 3s. 6d., 7s., and super., 100lbs., 5s., deducted from the value of the crop, *i.e.*, 20bush. at 3s. 3d., £3 5s., left a net return of £2 13s. per acre. After the peas were harvested the land should be cultivated, say during March, to encourage the growth of weeds In May it should be skim ploughed to a depth of about 2½in., and then half the area drilled twice with ¾bush. of either King's Red or Golden Drop wheat and 60lbs. of super. each way The other half should be drilled twice with 60lbs. of super. and 2½bush. Calcutta oats per acre. The return should average 2 tons per acre. The following season it could be grazed or fallowed. He had tried English rib grass, Italian rye grass, and prairie grass with good results, but the best for this district was the Mount Gambier spear or barb grass. Last year he sowed 30 acres with lucerne when drilling oats for hay, and this had produced some very good feed. Half an acre was covered with a thick coat of stable manure and sown with lucerne and peas. A good crop of the latter was secured, and the lucerne promised well The best soil for this was just at the foot of the sand rises. Mangolds had been broadcasted on land cultivated to a depth of 6in. and heavily dressed with stable manure, and a return of about 10 tons to the acre was secured. Thousand-headed kale rape, mustard, sorghum, maize, swedes, red and silver beets might well be given a trial in this district. The Long Red and Turnip beets did well, and there appeared no reason why sugar beet could not be profitably grown here. Mr. F. W. Eime preferred peas for fattening sheep and lambs. Lucerne tended to cause trouble with the sand, as the stock ate it close to the ground. It was better grown in small plots, irrigated, and fed cut. Mr. Marshall's estimate of the value of a pea crop did not take into consideration the cost of labor involved. Several members preferred hay as the best and surest fodder to grow. The Chairman said barley grass was doing well on his farm. Mr. Marshall, in reply, contended that whilst a good crop of hay could be grown on fallow, better results attended the growing of peas

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Lameroo, July 19.

(Average annual rainfall, 16·55in.)

Present.—Messrs. E. J. Troubridge (chair), Cameron, Jericho, Blum, Leckie, Lehman, Kumnick, C R. Eime, Wray, Ross, A. J. A. Koch (Hon. Sec.), and four visitors

Fallowing.—The Chairman read the following paper on "Fallowing":—"I feel sure that there is not enough fallowing done in this district," he said, "and what is done is not worked sufficiently afterwards. Although we have not much difficulty with weeds in this new country, I would advocate cultivating all fallow in the spring, and leaving the sandy soil rough after the cultivator to prevent drift. Heavy flat land can be harrowed down fine after cultivating. In respect to depth to fallow, different soils need different treatment. I find about 3in. quite deep enough for my land. I would like to state a few facts, which, if put into practice, will greatly help in growing wheat successfully. By fallowing early we can conserve more moisture, and June and July are the months that under ordinary circumstances will give the best results. Of course, this year somewhat upsets the practice of fallowing early, and one cannot say what will be the best to do. I am of the opinion, however, that it is better to do a little fallowing, even though the land is dry, and then work it back again when the rain comes. Light sandy stubble land should not be fallowed, as this encourages takeall. Such land should have at least a year's spell after cropping before fallowing again. Bush on the land should be cut and cleared off before fallowing. Not only can the work be done better, but after it is done it will give better results, as green shoots in fallow take the moisture that should be conserved for the wheat, I am sure that the Pinnaroo district when properly fallowed and worked will figure very prominently as a productive district of this State." In the discussion which followed members unanimously agreed that fallowed land well worked was essential to the safe growing of crops in this district.

Monarto South, July 19.

(Average annual rainfall, 14in. to 15in.)

PRESENT.—Messrs. G. Patterson (chair), A. P. Braendler, J. and H. Frahn, G. H. Gogol, A. J. and R. Hartmann, A. Harper, H. H. Hein, H. E. Kuchel, A. Patterson, J., G. H., R., and G. Paech, A. Schenscher, F. C. Thiele, E. Tillbrook, G. Thomas, J. Daley, J. Hutton, A. Forbes, C. F. Altmann (Hon. Sec.), and six visitors.

DESTRUCTION OF FOXES.—In a paper on this subject, Mr. J. Hartmann said the cheapest way of dealing with the fox pest was poisoning. The method he adopted was, when killing a sheep, to take out the pluck with a fork, care being taken not to touch it with the hands, and cut it into pieces about twice the size of an egg. These should be taken on a spade to places where the foxes were likely to visit. At each of these a hole about 3in. deep should be dug, and into this a bait dropped. This should be pierced with the knife and sufficient strychnine to half cover a threepenny piece inserted, and the bait partly covered with soil again. Dead lambs also made good baits, but remaining portions should always be buried, as dogs and cattle might pick them up. Some members thought birds were preferable as baits, as dogs would not touch them, but Mr. A. Hartmann reported having lost a dog in this way.

Monteith, July 14.

(Average annual rainfall, 14in. to 15in.)

PRESENT.—Messrs. D. J. Travers (chair), J. F. Connell, F. S. Bradford, A. A. Wells, J. Ferries, J. Rowan, sen., W. G. Gunn, W. H. Carter, Kirby, sen., A. Clark, J. W. McCulloch, G. Fraser, J. McAuliffe, L. Bell, T. Kelly, W. Kirby, W. S. T. McCulloch, C. A. Bentley (Hon. Sec.), and a number of visitors.

AGRICULTURAL BUREAU WORK.—The Secretary to the Advisory Board of Agriculture addressed the meeting on Bureau work. In conversation with owners of the irrigation blocks that day, he had learned that great differences of opinion existed as to the best means and times to irrigate and the best crops to raise, and that members generally seemed to be in agreement in the view that very little of the potentialities of the reclaimed swamps was known. He therefore strongly urged that some experimental work should be undertaken by the members for the Branch, to be under the supervision of a committee appointed for that purpose. At present individual members were doing some experimental work, but without definiteness, and without keeping careful records, so that results could be tabulated and averages worked out to show the effect of certain practices over a number of years. Mr. Nicholls also urged the members to establish the work of the Branch on a sound and businesslike basis. Punctuality in the commencement of meetings was essential if the interest of the best men, to whom time was money, was to be secured and retained. Good discussion followed. An experimental committee was appointed to prepare a plan of work for approval by the Branch, and to supervise same and to keep the records. A programme committee was also appointed, and a quorum. It was decided that meetings should commence punctually at 8 o'clock in future, and other details, such as finance, &c., were put upon a sound footing. Members were enthusiastic in regard to the possibilities for effective Agricultural Bureau work on the fertile reclaimed areas on the Murray.

Parrakie, June 14.

(Average annual rainfall, 16in. to 17in.)

PRESENT.—Messrs. F. J. Dayman (chair), A. J. Beelitz, H. Deiner, O. and C. Heinzel, A. F. Dayman, J. Temby, R. L. Beddome, R. E. Jose, N. and S. Good, T. Lewis, M. J. Cooney, J. O'Hara, A. C. Hameister (Hon. Sec.), and two visitors.

PIGS.—In a short paper on this subject Mr. J. O'Hara advised every farmer to keep a few pigs to consume that which would otherwise be regarded as waste. When purchasing, animals about eight weeks of age and well grown should be procured. Pure-bred pigs did not grow to such a size as the crossbreds. He favored the Berkshire-Tamworth, which made excellent bacon. As they required a good deal of attention, it was unadvisable to breed more than one litter at a time. They should be sold at eight weeks of age. Breeding, however, was not profitable unless plenty of feed was available. The best time for breeding was between May and July, when a good market was generally available. Some members thought the Berkshire-Essex cross pigs fattened more quickly than the cross recommended by the writer of the paper, whilst others preferred the Poland China-Berkshire cross

HORSES' SHOULDERS.—Mr. F. J. Dayman contributed a short paper in which he said care should be taken to see that the collars fitted the horses properly. As the animals fell away in condition, it was important to see that the collar did not become too loose. A piece of bran bag could be put under them in this case. When the shoulders became sore, the best method to adopt was to loosely stuff an old collar with horsehair, and line it with a bran bag; the trouble could then frequently be got over without the horses being spelled. The shoulders should be brushed well every morning, and before they started work after dinner. Some members favored leather lining to collars.

Parrakie, July 12.

(Average annual rainfall, 16in. to 17in)

PRESENT.—Messrs. F. J. Dayman (chair), F. W. Gravestocks, S. R. and N. J. Good, C. and O. Heinzel, T. Lewis, J. O'Hara, F. W. Randell, W. E. Threadgold, J. T. Temby, M. J. Cooney (Hon. Sec.), and four visitors.

CARE OF HARNESS.—In initiating a discussion on this subject, Mr. Congdon recommended unpiecing all harness and washing it with soft soap. Vacuum oil should then be applied with a stiff brush, and the harness hung until the oil dried well in. Mr. Temby preferred vacuum oil for heavy harness, as it soaked well into the leather. Messrs. N. J. Good, Lewis, and O'Hara favored neatsfoot oil. Vacuum oil contained properties that prevented it penetrating the leather. In reply, Mr. Congdon expressed the opinion that these properties acted as a filling, added to the appearance of the leather, and did not prevent the penetration of the oil.

Pinnaroo, July 19.

(Average annual rainfall, 16·74in.)

PRESENT.—Messrs. P. J. Edwards (chair), A. W. Burman, F. G. Bonnin, J. Docking, H. E. Dibben, Roy Edwards, L. M. Ferguson, L. M. Hannaford, M. Kelly, H. Ledger, J. Letheby, M. McCabe, E. H. Parsons, J. Pitkin, C. A. E. Schiller, J. Scales, W. and H. Venning, G. Wilson, P. H. Jones (Hon. Sec.), and one visitor.

SHEEP AND FENCING.—The following paper under this title was contributed by Mr. Ledger:—" This subject arose out of a discussion on 'Sheep on the Farm and Weeds,' by Mr. Kelly. It was clearly demonstrated that we are to have our full share of almost every variety of weed, and on a good many farms they were proving a drawback to crops at present. It is also fully admitted that the time has come when farmers should fallow. It is a very difficult matter to eradicate weeds by cultivation alone, more especially in stumpy country. Therefore we must have sheep, and must consider the question of sheep-proof fencing. I think that ultimately land in this district will be cropped once in every third year, so that the farm should be laid out with this object in view. Also that every paddock should lead home, so that no time will be lost in going to and from work. This can be done, at the same time having the homestead near the road. Water can then be laid on to each paddock with little expense. I consider it important that stock have free access to water. For a division fence I like posts of red gum, or if pine be used they should be split out of the butts of old trees, and all posts allowed to thoroughly dry before being put in the ground. One such post and four iron posts to the chain, with five plain wires and a barb on top, the distance between wires 5in., 6in. 7in., 8in., and 10in. should make a good fence. Keep wires well strained, for bad fences make rogues of all stock. We are in a dog-infested country, and the question arrises as to whether it will pay to dog-proof. I have been in search for information, as I had no previous experience in this line. To put up a fence I should like to see would cost £80 a mile; this would be only an ordinary dog-proof fence. I have full details of material and cost, which I should be pleased to let any member have. I have also some considerable information as to the profit derived from sheep, page 1408, July *Agricultural Journal*. G. H. Wright, of Hawker, has an article on this matter, which corresponds with other information I have on this subject. To fence a thousand acres would cost £400; 250 ewes for this area would return a net profit of, say, £85, after allowing 8 per cent. interest on outlay. Some may say this would not pay, but the question is will it pay to be without sheep taking into consideration the convenience of having them to run over the fallow when it would not be convenient to cultivate it. Much feed is going to waste. Sheep would reduce the butcher's bill by 50 per cent. Personally, I feel it would be money well spent. Some have suggested yarding sheep as an alternative, but this would mean lost time, damaged wool, meat driven off, and then the sheep would often be in the yard when they ought to be feeding. Further, as our country will grow lucerne, it will be worth our while to rear lambs, and these cannot be yarded. There is the question of fencing the hundred, which I think worth considering. There is no doubt the outside settler should be considered. He is always working against great odds and is on the border of a dog-infested area. I refer principally to the south, which must remain for a long time a dog-infested waste. I think the Government might be approached on this matter, but I should say let every farmer keep the dog-proof fence in view when putting up his ring fence." Good discussion followed. Mr. E. H. Parsons had been advised by an experienced sheepfarmer to use wire netting in lieu of the usual six wires. It was more satisfactory, and kept out rabbits. Mr. F. G. Bonnin said it sounded well on paper to fence the hundred, but there was a considerable area of scrub within the boundary which acted as a fine harbor for vermin. Mr. Schiller did not think it would pay to individually put up dog-proof fences. By keeping sheep a considerable quantity of cultivating was obviated. Mr. Scales thought the cost of fencing allowed in the paper was too much for the average farmer. Three wires would be quite sufficient if regular attention were paid to the fence after its erection. Mr. W. Venning also maintained that the fence could be put up at far less cost than figured by Mr. Ledger. He considered a wooden post every half chain with a strong iron standard between would make a very good fence. Mr. Burman raised the question of disagreement with neighbors; one might be disinclined to make his portion dog-proof. He questioned whether such a fence as advocated by Mr. Ledger would be of any advantage. Mr. Docking recommended alternating plain and barbed wires. While not altogether dog-proof, he had known such a fence to act very well. Mr. M. Kelly said that where netting had been put down, adjoining a sand ridge, in a few years a couple of feet had been submerged. In replying, Mr. Ledger said in respect to fencing the southern boundary, some dogs would be shut in, but as there would be no further influx these could very soon be killed. To prevent trouble from sand drift he would leave a chain of standing mallee on the outer edge of each sandhill. The Government average cost of a dog-proof fence was £80 per mile, but probably a less elaborate fence would meet the needs of the individual farmers. Dogs and foxes would climb over a straight fence, but if the top barbed wire leaned outwards this acted as a check.

Renmark, June 17.

(Average annual rainfall, 10·93in.)

PRESENT.—Messrs. J. S Huggins (chair), F. Cole, M. B. Geneste, H. S. Taylor, R. Nutall, C. J. Everard (Hon Sec.), and one visitor.

FRUIT-DRYING.—The general opinion of members was that in the majority of cases where racks were found unsatisfactory the trouble lay in that too large a quantity of fruit was put on the racks, or the fruit was removed before it was thoroughly dry. If the fruit were spread lightly it dried much more quickly.

MANURING FRUIT TREES.—In initiating a discussion on this subject, Mr. Muspratt said different soils needed different treatment, and every grower, if he wished to obtain the best results from his labor, must do a certain amount of experimental work. The average grower did not manure deeply enough. His own practice was to fertilise when furrowing out for the second irrigation, running the manure into the bottom of the furrow, by means of a hopper machine attached to the plough. The earth was then thrown back into the furrow, and the second furrow thus formed used for the irrigation. He applied

2cwts. or 3cwts. of bonedust, bone super., blood and crushed bone, or hashmagandy, with 1cwt. of sulphate of potash if the show of fruit warranted the application of potash. Potash was applied for the sake of the fruit primarily, and not for the plants, and the reason for leaving the application of manure till the second irrigation was that by this time it was possible to judge whether the crop would be worth an expenditure for potash. Green manuring was regularly practised by Mr. Muspratt, especially on the land carrying citrus trees, which was treated in this way every year. The best crop of green manure was peas. One hundredweight of super. was sown with the peas in addition to the general manuring mentioned above. Nitrate of soda, at the rate of about 2cwts. for vines and 1cwt. for citrus trees per acre, was applied when the plants began to show signs of sickliness. The promiscuous mixing of manures was a dangerous practice, involving, in ignorant hands, a serious risk of neutralisation of values. If several kinds of fertilisers were tried, the safer plan was to apply them separately It was not a good plan to use the same class of manure year after year. He recommended bonedust one year, super. the next, blood and crushed bone the next, and so on, but bone super most frequently. Horse manure was excellent for citrus trees. The soil was made more friable thereby, its humus content increased and heavier yields of fruit secured, but there was a tendency for oranges so grown to be thick skinned. Sheep droppings, if in good condition, made a valuable manure; good results followed its use after a season of succulent herbage, but if the sheep had been passing through a droughty period the manure was too hot and tended to dry out the land. The value of gypsum had long been established beyond dispute. But even gypsum could be overdone, its excessive use causing the soil to dry out and become parched. A similar effect was produced by the too free application of wood ashes. Better results had followed the use of lime. These dressings acted beneficially by affecting the mechanical texture of the soil and making available for plant use the fertilising elements it contained. They should not be ploughed under, but worked into the surface soil As a general practice, deep ploughing might be regarded as being as essential as manuring. Gum trees and peppers, so often used for windbreaks, were great robbers of the soil, and trenching would often be necessary to prevent their roots injuriously affecting the adjacent trees or vines. Mildura settlers had given up the practice of turning under peas in the green state, as they had discovered that they had a tendency to sour the soil. They were disked up in the green state first and allowed to dry before being ploughed under. But no necessity had been found for this in Renmark. Gypsum was valuable as a remedy for brown scale. For this purpose it should be dusted on the citrus trees when the fruit set. There was, as a rule, neither dew nor rain at that time, and a still, hot day should be chosen for the application. For the last three years Mr. Muspratt had applied sulphate of iron to his citrus land at the rate of 1cwt. to the acre. The use of this salt was generally advised when the leaves showed a tendency to "yellow." He had been troubled with "hard pan" about 2ft. below the surface of his citrus slope, and last season resorted to dynamite, using a case and a half on 3 acres. Holes were bored into the pan and charges exploded between the trees. Very marked results were already noticeable. Previously the roots had never been able to pierce through the pan. The entrance afforded by means of the explosives should greatly extend the feeding area and add to the vitality of the trees The average returns from his vines were—Sultanas, 1 ton per acre; currants, 1¾ tons; Malagas, 1¼ tons; and Gordos, 1 ton per acre.

Sutherlands, July 12.

(Average annual rainfall, 10·60in.)

Present.—Messrs. Snell (chair), Badge, Heusler, B. Mibus, J. B. Thiele, Dohnt, and Twartz (Hon. Sec.).

Preserving Eggs.—Mr. Badge read a paper on this subject, in which he advised members to preserve eggs when they were selling cheaply and market them when the prices rose. He pointed out that the shell of the egg was porous, and the white content was evaporated through these pores as the egg became older. A cheap and effective preservative was vaseline, which could be smeared over the egg, it then being wiped with a cloth. The eggs should be packed in dry sand, the small ends being upward. The case in which they were packed should be turned at intervals of eight or nine days. Another method was to smear the eggs with glycerine (oil of sugar) and place them in waterglass (sodium silicate). Pickle was frequently made from a solution of 1lb. of lime in a gallon of water, and eggs could be kept for months in this. He had kept eggs for seven months by smearing them with mutton fat and packing them in salt in a glass jar. They turned out perfectly good. He intended covering a few by way of experiment with some greasy substance and placing them in well water which on analysis showed the presence of sodium calcium, magnesia, and potassium. Solutions of soap and other colloids were found to exert a similar effect, and best results in this regard were secured from a mixture of waterglass and a 10 per cent. solution of resin soap, with a very slight excess of soda. Mr. Snell mentioned that he had successfully kept lemons for a considerable period by smearing them with vaseline

SOUTH AND HILLS DISTRICT.

Blackwood, July 14.

(Average annual rainfall, 27in. to 29in.)

PRESENT.—Messrs. W L. Summers (chair), P. H and D. Williams, Ashby, Gamble, T. C. A., A. W., and A. A. Magarey, Sibley, Philps, Eglinton, Scherer, Nicolle, L. and H. Sullivan, Winser, G W. Summers, Hilfers, James, Phillips, Savage (Hon. Sec.), and five visitors

CONTROL OF ORCHARD PESTS.—The Hon. Secretary read a paper which will be found printed on page 41 of the current issue

Cherry Gardens, July 15.

(Average annual rainfall, 35·03in.)

PRESENT.—Messrs. H. Jacob (chair), C. Lewis, G. Hicks, J. Lewis, C. Ricks. T. Jacobs, sen., J. Tozer, T. Jacobs, jun., H. Lewis, A. Broadbent, S. W. Chapman, E. Broadbent, A. R Stone (Hon. Sec), and two visitors.

PIG-KILLING AND BACON-CURING —Mr C. Ricks read a paper on this subject. The method of killing a pig that he recommended was to place the animal on its back and make a slit of about 4in. in length in its neck parallel with the jugular vein. Whether the water was of the required temperature for scalding or not could be determined by placing a small amount of blood from the pig into it. If this diffused over the surface and did not sink, the pig could be safely placed in the water. Water at the required temperature would also throw a clear reflection When the bulk of the hair was off the pig, the animal should be taken out and scraped with a short-handled hoe, or a piece of hoopiron with the ends fixed into pieces of wood, to take the hair off the head and legs. The next move was to rub soap and warm water on the beast until a good lather was secured, when it should be scrubbed off with half a brick. After this the carcass should be hung and table salt should be well rubbed all over it Whilst the animal was still hot the inside, eyes, and jaw should be taken out. In favorable weather the killing was best done during the afternoon of one day, the cutting receiving attention early the next morning. But in warm, sultry weather it was safer to cut the carcass at once and salt it whilst hot The disadvantage of this method was that the meat was flabby, and so more difficult to handle. He used 4lbs. of white sugar and 2lbs. of salt to 100lbs. of meat for curing, rubbing the rind first and sprinkling the meat inside. The second day ¼lb. of saltpetre and 4lbs. of salt should be added. The sides should be placed alternately one on the other daily for a week, and then every other day for 14 days. The salt and sugar should be well pressed and rubbed into the meat, and the brine pressed out of the hams. It should be ready for hanging at four weeks. Any salt adhering to the sides should be washed off and brown sugar rubbed over them. After it had dried the bacon should be placed in flyproof calico bags and hung in a cool, dry cellar for six months, when it should turn out of first quality. In discussing the subject, Mr. T. Jacobs, sen., advocated sticking the pig whilst it was standing. For scalding large animals he would place them on a wooden stool or table and pour boiling water from an ordinary watering can on to one-half of the carcass at a time. He always made a practice of cutting whilst the bacon was still warm, and the results had always been successful. Mr. Tozer said it was better to have the water for scalding slightly under rather than over the required temperature, as when it was too hot the greatest difficulty was experienced in cleaning the carcass. It was better and easier to add hot water if required.

Gumeracha, May 20.

(Average annual rainfall, 33·30in.)

PRESENT.—Messrs. B. Cornish (chair), D. Hanna, J. B. Randell, J. Porter, and W. B. Randell (Hon. Sec.).

HORSES' HOOFS.—Following on the reading of an article from the *Journal*, Mr. D. Hanna said it was the duty of all shoeing smiths to study the hoof of the horse and not to pare away more than was absolutely necessary to ensure the shoe fitting. Too much cut away from the outer side was likely to make the horse pigeon-toed. Fitting a red hot shoe resulted in the hoof becoming brittle. It was quite unnecessary to trim the feet of foals. Rasping the hoof and paring away the frog should not be permitted. Mr. Porter had treated with axle grease hoofs which had a tendency to crack; this toughened the hoof. Horses reared on level country developed large hoofs, whilst those bred in hilly districts developed smaller hoofs, a provision of nature to secure surefootedness. Mr. B. Cornish recommended farmers living a distance from a shoeing smith to have a small forge and tools. The removal of a shoe, or the driving of a nail or two to tighten a loose one, would not take nearly the time that was involved in the journey to and from the smith. He believed in trimming the frog slightly to prevent stones becoming jammed between it and the shoe. To prevent horses striking, the outer part of the hoof should be trimmed down more than the inner. Mr. J. B. Randell did not think foals' hoofs needed trimming. Unskilled shoeing he thought would ruin a horse.

Gumeracha, June 16.

(Average annual rainfall, 33·30in.)

PRESENT.—Messrs. B. Cornish (chair), J. Porter, D. Hanna, H. W Norsworthy, J. Monfries, J. B. Randell, A. E. Cornish, A. H. Cornish, and W. B Randell (Hon. Sec.).

FRUIT-GROWING.—Mr. J. B. Randell gave a very able and interesting address on the subject, "Does the Present Outlook of the Fruit-Growing Industry Justify Further Planting." In reviewing the present situation he said that the market for fruit in the old world had been poor, owing to the second-class produce arriving in poor condition. He spoke very strongly against growers sending any other than the very best for export. He was very hopeful for the future of the industry, but insisted that anyone going in for it must be in downright earnest, have a love for the work, and strenuously endeavor to produce the very best. Mr. H. W. Norsworthy, who had had some experience in packing, said that in a great many instances the fruit was picked and packed before it had matured. As an experiment, he had put aside some fruit that he considered insufficiently matured, and in two month's time it was rubbish compared with properly matured fruit. He recommended orchardists to turn their attention to stone fruits, especially plums. Other speakers were of the opinion that marketing poor quality fruit operated against the industry. The growing of plums and prunes should receive more attention.

Hartley, June 16.

(Average annual rainfall, 15in. to 16in.)

PRESENT.—Messrs. B. Wundersitz (chair), W. Bermingham, H. Cross, A. Wundersitz, D. Clark, W. Brook, B. Klaebsch, T. Phillips, G. Phillips, G. Hill, C. Klencke, S. Beavis, S. Pratt, J. M. Hudd, J. Hudd, D. F. Westwood, F. Lehmann, F. Bruns, J. L. Forbes, and J. Stanton (Hon. Sec.).

CLEARING.—In a paper dealing with the advisableness of clearing the land in this district, Mr. W. Bermingham said the farmer had to deal with bluestone reefs, and old gum stumps cut off a few feet from the ground some years ago. The stones should be picked and deposited in large heaps or in water washes. In addition to the enhanced value of the land when this was done, there was a saving in the wear and tear on implements, which should be considered. The stumps could be burnt off, cut level with the ground, or, better still, grubbed. Disc ploughs and cultivators were best for use in stony land, and he had found it a good practice, when outcrops of stone were encountered, to make a fire on them, after which they could be easily broken off. Members generally agreed with the ideas of the writer of the paper. The best means of getting rid of old stumps was burning with the aid of cocky chaff.

Inman Valley, June 6.

(Average annual rainfall, 26in. to 27in.)

PRESENT.—Messrs. J. R. Russell (chair), J. W. Crompton, H. J. and M. J. Meyer, A. McCoy, G J. Barratt, H. G. Allert, T. G. and R. Rose, H. T. Martin, H. I. and R. J. Martin, H. J. Jagger, R. A. Mayfield, H. M. Parsons (Hon Sec.), and three visitors

PRUNING FRUIT TREES.—The following paper was read by Mr. J. W. Crompton:—" Pruning is an art whereby the strength of the plant is directed into certain channels, bringing about, in the case of the young tree, the quick development ot branches desired, and in the case of the older tree the satisfactory bearing of fruit. In nature fruit is born for the sake of reproduction, the seed being the main object. The pulp is there, so that animals and birds will assist in spreading the seed, and provide a suitable bedding for its germination. Men have increased the proportion of pulp and sugar, and modified the flavor by cross fertilisation, selection, tillage, and pruning. If left unpruned most fruit trees grow to a considerable size, bearing greater average crops than a pruned tree. But the crops are irregular, and the fruit often very small, and lacking sweetness and juice and, perhaps, flavor. In the orchard the trees are mutilated for the sake of increase in the total weight and regularity of the crops to be obtained from a certain area of land. The objects aimed at in pruning are—First, to keep the tree of a size and shape that will allow of easy picking, &c., without damaging the tree, and effective spraying, which is very important. Second, to keep the tree in a healthy vigorous condition; setting and holding its fruit. The weakly tree sets its fruit readily, but either it drops off, is lacking quality when ripe, or the tree is made weaker still. The tree that is growing very strongly does not set its fruit in sufficient quantity. The aim is to gain the medium between these extremes. The same applies to separate shoots, and dealing with those is the main problem in pruning. Every live shoot cut off in the winter means greater vigor thrown into the rest of the tree. In the summer the opposite obtains. All plants grow more vigorously on upright shoots than horizontal ones; they grow strongest at the top and where there is most light. In view of all these points it has been found that it is desirable to shape the tree, to have all its main branches curving evenly outwards and upwards from a single stump, thus forming a sort of cup shape, hollow in the middle, with the short lateral growth on these main branches from the bottom to the top. If the centre of the tree is not kept open, and the light cannot get at the lower parts, the lateral growth, which bears the fruit, will become weak or die, and the crop is born so much higher up and more out of reach, and is very likely not there in such quantity. The ideal shape for a fruit tree is an open cup shape with side growth all the way up the branches This cup shape is varied with the different kinds of trees, according to the rigidity of the branches. The more easily they bend the more upright they should be trained. The peach, the apple, and the apricot have stiff branches and are trained in the shape of a rather squat teacup. The pear, the plum, cherry, and the almond are trained more in the shape of a long wine glass, with the branches spreading nearly horizontally at the bottom, and dividing as low as possible into 12 to 18 branches, which stand almost straight up without dividing again. Shaping these trees in this manner prevents the branches being weighed on to the ground, and they are less likely to break if they do not divide high up, as there is no abrupt change in thickness. The principal pruning operations take place in the winter while the tree is dormant, but summer pruning is often necessary, especially with the peach. It takes place about the beginning of November, when the tree is growing its strongest. It is with winter pruning that it is intended to deal chiefly, and for an example the apple is selected, as apples are the commonest and most important in this district and the most typical, owing to climatic conditions. The stem.—The usual height for the stem of any fruit tree is a foot to 18in., but this is increased in places liable to late frosts. The only advantage of a long stem is to get the tree out of the reach of frost. The shorter stemmed tree is stronger against wind, more easily got at to prune and pick the fruit, and shades the ground more thoroughly near the stem. When planted out in the orchard a young tree is either cut back to a whipstick of, say, 15in high, or if it is big and well supplied with roots it is treated in the same manner as an established tree When planting out, the root system is greatly reduced by the digging up, and the top should therefore be cut back hard in order to preserve a balance. After the first year's growth in the orchard three shoots should be left, if they are nicely spaced and spread. Cut these above buds facing outwards and close under the bud above. This causes the resulting shoots to stand well out. The second year, with average growth these shoots can be cut to side buds, with a view to dividing into six main branches the following year. After that, as the tree increases in size, the branches can be again divided and subdivided according to available space. The branches can be allowed to take a more upward direction. During the young stages of the apple tree, and, in fact all trees, a great deal can be done in the growing period towards keeping the growth even, by nipping out the tip—only the bud—of those shoots which are growing too far ahead. With young trees it is a common mistake to be too particular about keeping the middle open Growth in the centre greatly assists in spreading the outer branches, but it should not be allowed to become too vigorous. If, through difficulties in shaping a young tree, a branch has remained in the centre until the tree is three or four years old, do not cut it all out at once, but cut it back harder and harder each year, preventing it from growing thicker, and allowing the other branches to develop until the relative size of the scar is much smaller. We now have our three-year-old tree with six main branches spread evenly all round, and probably growing strongly, therefore with strong shoots all over it. The leading shoots should be chosen to continue the main branches, all these leaders being cut as near the same level as possible, and fairly long. The rest of the strong shoots should be cut out or shortened to an inch or so, according to how they are spaced. Any fruit spurs, that is the short wrinkly growths with the large fruit buds on them, are probably better left as they are. Fruit shoots, as they are called, the slender shoots about a foot long with fruit buds on the end and usually standing out horizontally, can be left whole. If they bear any fruit on the end they will be weighed down and will send out short spurs at the bend. If not left whole they should be shortened considerably. No strong shoot should be left in the middle or low down unless it is intended to fill up a gap in the formation of the tree. If the tree is shapely at this age the pruning in after years is easy. The only art is to judge how much to cut out, and how long and how wide apart to leave the leaders. A strong-growing tree often needs scarcely any cutting, but a weaker one needs to have the fruit wood thinned out to prevent it over bearing itself. Keep the fruit as close to the thick branches as is reasonable, then the amount of fruit blown off by gales is minimised. Trees are apt to get broken by a stray cow, or a branch gets caught by the plough tackle. Under these conditions it is difficult to give definite advice, but we must patiently set to work to fill up the gap in time, by selecting a leader, running it up quickly and allowing it to bear little or no fruit till it is up to the general height of the tree and strong enough to carry the crop without being permanently bent too low. This district is well suited to apple-growing, and consequently the pruning is easy if the site is good. No matter how the tree is pruned it will bear some apples at all events. The Pear.—It will be remembered that the branches of the pear should stand more upright than those of the apple, and that they are nearly level at the bottoms, bending suddenly upwards. To get the young tree to spread well, the best way is to leave all or almost all the shoots on the one-year-old tree, simply shearing it, that is, cutting all the shoots to the same level and fairly short. The result should be a thick, round bush, not open in the middle. The second year the tree may be treated similarly, but probably the middle can be thinned out a little, and, of course, any crossing branches must be cut out, and also any shoots that lean towards the opposite side of the tree. By the third year the tree should be able to have the middle cleared out and the required number of main branches selected. When this is done it has a very sprawly appearance, with the 12 to 18 leaders turned upwards. If it is still not spread enough a little central growth will continue to force it outwards. Do not forget the simple process of nipping out the tips in the growing period. It is most effective, and if only the growing bud is removed from excessively strong shoots it is wonderful how the other shoots catch up, and the weakening effect at the time is practically nothing. This attention will save a great deal of trouble and cutting in the winter and, more important still, it reduces the size and severity of the scars. The yearly pruning of the tree is much the same as that of the apple, except for the difference in the shape of the tree. The treatment of the fruit-bearing wood is almost the same, but the strong shoots on the pear usually have fruit buds near their ends. When selecting a leader any fruit buds should be broken off, otherwise the said leader will be bent right down with the weight of the fruit on its end This tendency of strong shoots to bend over with the weight of fruit is often made use of when pruning a badly-shaped tree. One that has run up too straight from the stem when young and has been spread too high up finally becomes a series of layers of branches, some drooping to the ground and others leaning at different angles, and all slowly drooping lower year after year. Such a tree cannot be remodelled into the standard shape. It will bear just as well, though it is more difficult to plough round and to spray, and the fruit is more liable to be shaken off by wind. When pruning it, some of the lower branches may need shortening to keep them off the ground. The others need thinning out perhaps, and the strong growth at the top can also be thinned out, any crossing wood cut away, and provision made for more of these spreading branches, which are continually drooping lower and lower, and therefore need replacing at the top. When doing this a shoot can be developed into a sturdy branch by breaking off the fruit buds, but unless it is kept upright it will soon begin to droop permanently when it bears crops of fruit. Trees of this type are common in private gardens, and are not unsatisfactory. The Peach.—The formation of the peach tree is like that of the apple, except that the fruit-bearing wood being longer it is necessary to have the main branches wider apart. The bud formation is different. The apple and pear have their fruit buds large and distinct, and the wood buds are very small and often by themselves. The peach, and in fact all stone fruits, seldom have wood buds on a young shoot that has not a flower bud on each side. The fruit bud of the apple and pear grows a short spur of wood with a bunch of flowers on the end. The flower bud of the stone fruits is actually a flower bud and opens directly into a flower. The tree is shaped like the apple and the fruit is borne on the short lateral growth, which each year needs cutting back and thinning out according to the vigor of the tree, and, of course, any dead bits removed. The chief art is to keep the growth close to the main branches. The apricot is shaped a little more upright than the peach, and is pruned almost exactly the same, but the main branches may be closer together. Smooth-barked wood on the apricot that is three or four years old will send out shoots, if all beyond is cut off, which is by no means the case with other fruit trees. This is useful in renovating an old tree. The plum is shaped like the pear, but otherwise the pruning is a close repetition of the apricot. The almond is also shaped like the pear and its bud formation is very like that of the peach. Almond trees are often shaped and then left almost unpruned with satisfactory results if the climate is suitable. The chief difficulty with the cultivation of almonds is that they are not easily suited with the right soil and climate, and often the whole crop is destroyed by wind or cold weather. The cherry is another tree that is seriously affected by climatic and soil conditions. It is shaped on the upright model and treated much the same as the almond. It is very subject to rot, and therefore it is wise to avoid cutting as much as possible, and dress all scars with something to keep out the wet. The quince is pruned similarly to the plum, if pruned at all. It is a ready bearer and only needs to be kept healthy. As it is troubled very little by blights, pruning is seldom carried out at all unless it is to allow the fruit to be picked more easily. Tools.—A thoroughly sharp knife is a good tool to use among very young trees, as it does not bruise the bark; a blunt knife is very bad. Knives are slow, however, and for ordinary work shears or snips are used. If kept sharp they do very little damage to the tree, provided they are used properly. The curved pruning saw is for removing the larger branches. The scars resulting should be smoothed round the edges with a sharp knife, to remove the bruised part. No piece should be left jutting out far, and the scar should be kept as small as possible. A large scar should be smothered over with something to keep out the wet and germ life, and thus prevent rot. The best dressings for this purpose are as follows:—(1) Common lead paint, preferably white; (2) grafting wax; (3) thick Bordeaux mixture, *i.e.*, bluestone and lime spray; (4) Stockholm tar. The paint, the Bordeaux mixture, and the tar possess antiseptic qualities and are all good and effective. Grafting wax has the disadvantage of being expensive. Stockholm tar, though last on the list, is always at hand, and is therefore probably the best after all, as it can be put on as soon as the cut is made. A dressing of this sort is most necessary with the cherry tree. If one side or a branch of a tree is allowed to stand higher than another the tree will become more and more lopsided and the desired shape will be lost. If a low branch is prevented from bearing much fruit, and the lateral growth is kept short, it will soon make sufficient growth to regain the balance of the tree, unless it is seriously damaged by rot, breakage, or sunburn. The loss of a little fruit for one or two years on this part of the tree is soon amply repaid when the tree again becomes even and shapely. It is good economy to look upon the bearing of fruit as a secondary consideration during the first four or five years after the trees are planted. Shape the young trees well, and the cost of keeping the orchard will be at a minimum for the rest of the life of the trees. There are no hard and fast rules for pruning, but I have endeavored to show the ideals to aim at, and the principles to follow in order to attain them. All this, however, is worth little compared with commonsense and experience." Mr. C. Beaumont recommended Rome Beauty, London Pippin, Cleopatra, and Dunn's Seedling apples. March was the best month in which to plant orange trees in this district, the roots would then be well established before the winter. A piece of bagging should be put on the east and over the top of the young orange trees, to prevent the sun shining on them whilst the frost was on them. They should only be pruned sufficiently to allow of the light gaining access to all parts, and to facilitate spraying. These trees would do well in properly drained soil, even if a heavy rainfall was experienced. Drainage was best done by using a 4in. pipe. It was a good plan to go through a heavy subsoil with a subsoiling plough. This district was a good one for fruit-growing.

Inman Valley, July 16.

(Average annual rainfall, 26in. to 27in.)

Present.—Messrs. H. J. Meyer (chair), H. J. Jagger, H. G. Allert, R. A. Mayfield, V. J. Tugwell, R. J. and H. T. Martin, L. V. Hurrell, M. J. Meyer, A. McCoy, F. J. and J. G. Barratt, H. M. Parsons (Hon. Sec.), and three visitors.

Potato-Growing.—A paper on this subject was contributed by Mr. Tugwell. The swamp lands, he said, should first have a main drain to carry off surplus water, and this should be large enough to cope with floods, or serious damage to crops might result. He would commence to clear at the low end and work up, to facilitate putting the inside drains in the best places. He would dig in July or August, so that the soil would be sweetened for October and November planting. Sandy soil should be ploughed early with the first rains, and planted with such crops as barley or oats, to be dug in before planting potatoes. Silty soils he would plough early and leave, only working them up if weeds appeared before planting. For the swamps the seed should be grown in sandy soil and should come from the best of the crop. He would select them about the size of a small hen's egg and plant them whole, as cut seed were liable to rot in the swamp. For sandy soil he would select seed from which four sets could be cut. For the silt in the Inman Valley he recommended seed about as large as a hen's egg or a little larger, which could be cut in two to destroy the crown eyes and thus prevent too many tops from growing. *Planting.*—The best returns were secured by digging in the seed. The next best method was to plough the land and then drill in the seed across the furrows. The method least recommended was to plough the seed in. On the swamps, October, November, and December planting gave the best results, the seed being put about its own depth below the surface, from 1ft. 6in. to 2ft. apart, with 2½ft. to 3ft. between the rows. He recommended about half a ton of bonedust or potato manure per acre put in on the seed. On sandy soil the seed could be ploughed in to a depth of 2in. to 3in. and the manure spread broadcast on top. Silty soils, when properly cleared and planted in September to November with 1ft. 6in. between the seeds and 2ft. 6in. between the rows, with half a ton of bonedust or potato manure, stubble or cattle dung, either spread on top or in the furrows, yielded well. The crop should be hoed at least twice on the sandy and silty soils. On the swamps there was usually enough top growth to shelter the crop. He preferred sprinklers for irrigating. Digging out the tubers was most easily accomplished by using a five-tine fork, but ploughing was a quicker method, if not the cleanest, of getting up the crop. When picking up, the best seed from the best plants should be saved and the inferior tubers sold. *Varieties.*—For the swamp lands—Carmens, Redskins, Up-to-Dates, Prolifics, and Snowflakes, the last-named being particularly well able to stand the wet and yielded a heavy crop with six month's growth. The others would grow in about four months. For sand—Carmens, Up-to-Date, Bismarck, and Redskins, planted in January and February for early crops. Any of these varieties would do well on the silt with irrigation. The use of pig manure would encourage scab. Finally, he said, that with water and manure potatoes could be grown in any soil. Good discussion followed. In reply to questions, Mr. Tugwell said he picked out the potatoes after digging that were running wild. Flooding the potatoes while the tops were green, to kill the grubs, would not injure the growing tubers if done quickly and quickly drained. Mr. Jagger preferred to pull up all roots of plants that had a tendency to run wild while they were growing if it was intended to secure seed from that plot. Mr. Allert recommended a trial of sulphate of potash for potatoes.

Farm Improvements.—Mr. H. J. Jagger read a paper on this subject. He would confine himself to one or two lines of farm improvements, he said. Most farmers in this district were being faced with the fence problem. A stock fence on the clear land on the Bald Hills was not suitable on scrub country that was subject to fire. If obtainable, he preferred split posts of pink gum, from trees that would split two or four or even more to the length. If pink gum was not easily obtained, red or blue gum made good posts.

The trees selected should be neither too old nor too young. The posts should be about 5ft. 8in. or 5ft. 9in. long, and not less than 5in. by 4in. at the small end. The strainers should not be less than 1ft. at the small end and 7ft. long for the end or corner posts, and 6ft. 8in. for use in the middle of the fence. These, together with struts or stays about 15ft. long and not less than 4in. at small end, should be placed on the line in the dry weather when the hard ground facilitated carting. The erecting should be done when the ground was thoroughly wet and soft, and the holes were easily sunk. It was important to have the sight sticks firmly and correctly placed in a straight line. Pieces of ½in. or ¾in. gas piping, 6ft. or longer, served the purpose excellently, if a piece of iron sharpened to a point was driven into one end, and the other painted white. For ordinary purposes a fence 3ft. 6in. high, with the posts 3ft. 8in. above ground, was all that was needed. Barbed wire he did not like, for it was dangerous to stock if slack. Seven wires made a better fence than six, and No. 6 wire was preferable to Nos. 8 or 10. For ordinary fences, where cost had to be kept down, six wires were enough, the top being No. 6 and the others of No. 8 galvanized wire. If no cattle or horses were likely to run in the paddock six wires of No. 8 would suffice. The posts should be 8ft. apart or eight to the chain. The strainers not less than 5 chains apart, and if the ground was fairly level 7 or 8 chains between was not too long a distance. To bore the posts he would use a ⅝in. bit, making the bottom hole not more than 5½in. above ground. The next three spaces each 6in., with 8in. between the fourth and fifth wires, and 10½in. between the top two. If new wire were used a spinning jenny was useful. The strainers should be securely rammed and firmly strutted, especially at the ends and corners. Strain the top wire right through the whole length of the fence before straining the others, to guard against the possibility of the centre strainers moving. Then work downwards. New wire should be stretched by treading it during the straining. For a fence subject to scrub fires, wooden posts should be placed farther apart, say 42ft., with one tee iron post between and two flat iron posts between the tees and the wooden ones. It was best to bore alternate strainers only, as the draught through the auger holes, in case of fire, caused the strainers to burn. The wires could be put round the others and stapled in position. All scrub, etc., that would help to destroy the fence in case of a bush fire should be removed. *Buildings.*—No hard and fast rules could be laid down in regard to these, but in all cases they should be substantial. Buildings erected as a makeshift often had to do service as long as they would hold together, and were often unsightly and inconvenient. It was wise to plan out the proposed building, drawing a rough sketch, and taking note of future requirements. When putting up a stable one should keep in view the probability of needing a chaff house in a suitable and adjacent position. Farm buildings dotted down without any method looked bad and were not convenient. If stone was easily obtainable this should be used for farm buildings. Almost any handy man could do his own mason work. If lime was scarce, pug could be used and the surface flushed and pointed up with mortar. In the absence of stone, galvanized iron was the next best material. Waste timber and split slabs might be used for sides, but iron was best for the roof. Members agreed that the height suggested in the paper was sufficient for all quiet stock. Emphasis, however, was laid on the need for very thorough strutting. Resisteel was said to be a good material, which did not get slack so quickly as iron wire, but it should not be bent too short round strainer posts or drawn too tight. Mr. Hurrell thought iron too cold for stable roofing. He preferred to thatch. Others thought that the danger of fire and need for periodical repairs rendered thatch unsuitable for this purpose.

Kanmantoo, June 14.

(Average annual rainfall, 17·90in.)

PRESENT.—Messrs. A. W. Hay (chair), W. Shepherd, W. Johncock, R. Downing, R. Critchley, J. Mills, J. Critchley, H. Downing, S. Downing, H. Shepherd, W. Mills (Hon. Sec.), and one visitor.

WOOL.—Mr. J. Mills contributed a paper, in which he said that different types and qualities of wool were yielded by different sheep, and these had to be separated before the raw material could be made use of. For classing, a rolling table about 10ft. by 4ft. 6in. and piece-packing tables about the same size and in numbers according to the quantity to be handled, were necessary. A classing table capable of carrying a dozen fleeces was required, and the tops of all should be so constructed that the backs and second cuts would fall through. The fleece should be taken from the shearer by each breech, the rest of the fleece being gathered towards the body and then thrown on the rolling table so that the outside edges just fell to the edge of the table. Skirting should commence from behind the shoulder, working towards the head, taking off all burrs, sweaty pieces, and daggs, together with any remaining belly and britch wool. Both outside edges should then be turned in, and the fleece rolled from the britch to the shoulder. Pieces and bellies should be treated similarly, but if the clip were small the latter should be skirted lightly, and the skirtings from each could be mixed. Small clips should not be classed into more than two lots, but in any case all strong and tender pieces should be kept out, as one of these found in a bale by the buyer would result in a lower price for the lot. Placing the wool in bins before baling would enable the classer to detect any mistakes that might have been made. The branding on the bales should include the name of the station, the class of the wool, with the sex of the sheep, and then the number. This should be placed on one side running with the cap of the bale, and on the top, which would obviate trouble in picking out. Mr. Hay thought two lots of fleeces, with the extra strong, fatty, and broken fleeces taken out, was sufficient for the small grower. He would not take out the tender (as distinct from broken) wool, but would put it in the second class. The Hon. Secretary thought that if the bulk were sound, it would pay to keep the tender wool, *i.e.*, that which would break easily between the fingers, by itself. Broken wool should certainly come out.

Meadows, July 14.

(Average annual rainfall, 35·52in.)

PRESENT.—Messrs. G. Ellis (chair), G. T. Griggs, H. A. Kleemann, W. J. Stone, F. Nottage, H. Thorn, A. L. Ellis, F. W. Vickery, E. W. Vickery, J. Stone, W. H. Bertram (Hon. Sec.), and two visitors.

FATTENING SHEEP AND LAMBS IN THE HILLS.—The Hon. Secretary read the following paper on this subject:—" In a district like this, especially on the better class of land, no farmer should sell his sheep or lambs for stores unless for breeding purposes, because if sold as stores the man who buys and fattens is in most cases the man who makes the profit. Care should be taken never to overstock. It will pay well to have plenty of feed, as sheep grow much larger and faster, and when put in the fattening or topping-off paddock do not take nearly so long to be ready for market. The farm should be fenced into convenient sized paddocks. I would advise farmers in this district to direct their attention more to the cultivation of field peas for topping off sheep and lambs. It is very necessary to have a good supply of water in the paddock, as peas are very heating, especially in the summer months when ready for feeding off. Nearly all our rough land, when cleared, will grow peas, and you will agree that it will be only by means of cultivation that we will be able to make good grazing paddocks. The natural grasses in the Hills districts are very poor for fattening purposes; in fact, my experience has been that taking this district on a whole it is even very poor store country for stock on its natural grasses excepting during October and November. One of the chief drawbacks is a deficiency in salt. Growing peas for grazing purposes not only improves the paddocks by means of cultivation, but ought to be turned into a good paying proposition from the first year if grazed off with fat stock, to be put on the market labelled prime quality. If we do not breed sufficient lambs on the farm, there is generally a good opportunity of buying well-grown fat lambs in December, when the natural spring grasses are done. Your pea paddocks will thus top them off during the months of January, February, and March, when feed is scarce in other parts of the State, and you can generally rely on a first-class market for prime quality stuff from March right through the winter months. In a district like this, where we can only keep a limited number of sheep, it will pay us to put them on the market in a prime condition, as there is always a keen demand for prime quality, whereas what we call fats are not so keenly competed for by the trade." Discussion—The Chairman considered that an acre of fair average peas would top off from 20 to 25 lambs. Peas made the meat a yellowish color, and butchers always preferred lambs topped up on this crop for prime quality. Members generally considered that a crop of peas was one of the best fodders for topping off lambs and sheep.

ANNUAL REPORT.—The Hon. Secretary reported that 11 meetings had been held, with an average attendance of 11·5. Good practical subjects had been discussed at every meeting, and during the year the Conference of Hills Branches had been held under arrangement with this Branch. The Hon. Secretary said that there was need of a larger membership of producers who were willing to give their knowledge to others. He urged fellow members to take up the work of the coming year with energy and enthusiasm.

Meningie, July 19.

(Average annual rainfall, 18·87in.)

PRESENT.—Messrs. W. Tregilgas (chair), Ayres, Hiscock, Scott, Deane, Newson, Hastings, Mincham, Martin, Williams, and Wright (Hon. Sec.).

DRENCHING STOCK.—Mr. R. M. Scott read the following paper :—"It is very necessary for persons that own stock to know how and be able to give medicine, both in the form of drenches and balls. Many a dose of medicine, of the utmost value to the animal, is lost through not knowing how to administer it properly. Small doses of liquid are best given to the animal with a syringe. With a horse, stand in front of the patient, fill a syringe (one that can be worked with one hand is absolutely necessary), open the mouth with the left hand by inserting it through the mouth and holding the fingers up on edge, pass the syringe between the fingers, and shoot away ; withdraw the syringe and elevate the head a little with the left hand. So continue till the dose is all down. When properly done, not a drop is wasted and the horse is not excited. With large doses a bottle must be resorted to. Pass a loop in the mouth of the horse to catch the upper jaw, then raise the head a little by running the line over a pulley. No animal can swallow with the head too high. Stand on the right side of the patient and pour the medicine very slowly, never use any violence to make the horse swallow, let it have its own time. Should the animal cough, strangle, or choke, let the head down immediately. It does not matter if the medicine is lost. It is better to lose the medicine than the animal. Medicine may be given to a horse by what is known as a ball. Make the ball about the size of a man's big finger. Stand in front of the animal, and take a firm hold of the tongue with the left hand. Draw it down between the front teeth, but never draw it to one side. Take the ball between the fingers, the thumb being drawn into the palm of the hand. Then pass it back, placing it on the root of the tongue, and as you let it go give it a little push with one of the fingers. Take the hand out of the mouth and let the tongue go, and close the mouth and lift the head a little. If you then watch on the left side of the neck you will be able to see if the patient has swallowed his medicine. Even in this operation be sure not to abuse or excite the animal, but let it have its own time. A pig cannot take a drench properly if you hold him on his back—his head must be rather down than up—and the same applies to cattle. Dogs must have their teeth almost closed before they can take anything down the throat. Many a good dog has been killed through holding its mouth open when trying to give it a dose of medicine."

ANNUAL REPORT.—The Hon. Secretary reported that 12 meetings had been held during the year, with an average attendance of nine. The average number of meetings attended by members was 4·1. There were now 15 on the roll. Five papers had been read and one homestead meeting held. He appealed to members to put more energy into the work of the Branch, and before the meeting closed an excellent programme of subjects for the ensuing 12 months was adopted.

Morphett Vale, July 15.

(Average annual rainfall, 23·32in.)

PRESENT.—Messrs. L. F. Christie (chair), H. O'Sullivan, H. V. Sprigg, J. Perry, A. Anderson, F. Rosenburg, T. Higgins, and E. E. Hunt (Hon. Sec.).

SHOEING HORSES.—Mr. Christie read a paper on this subject, in which he said—Under ordinary circumstances the colt should have a sound, perfectly formed foot, with very little excess of horn, the front nearly round, the hind slightly oblong. If the surface is uneven level it down with the rasp. Then select the shoe, which will require to be heated. First form the toeclips, which should be short and strong, and not a great triangular projection reaching half way to the coronet, and which, when hammered in at the point, causes a pressure on the sensitive interior, and often lameness. While the shoe is hot shape it to fit the foot. Apply it to the surface when hot. This will indicate any unevenness. Rasp or pare the hoof until the shoe has an even bed. When fitting the shoe burn the hoof but slightly, as this is ruinous to the horn. Keep the shoe wide at the heels, well outside the walls, and clear of the frog. Do not touch the sole, frog, or bars, as nature has provided them for protection, and the old style of paring them away should not be permitted. After fitting the shoe to an even bearing, place it on the anvil and with the hammer spring the heels about $\frac{1}{16}$ of an inch, or less, so that when nailed on the foot there will be no bearing on the heels. This is a very necessary precaution with horses that have weak heels or quarters. For a light horse six nails are sufficient. They should be well towards the toe on account of the expansion and contraction of the heels when the horse is in motion. Never drive the nails too high up, but give them a short, firm hold. A good deal depends on the thickness of the walls, and horses vary considerably in this respect; therefore discretion must be used. I have often known horses go very lame after shoeing, and have found that though they had not been pricked, the nails had been driven so near the quick that they must have caused intense pain. If a horse flinches when a nail is driven it should be withdrawn at once; if pricked there will be a slight bleeding, but seldom any after effects. It is a good plan to pour a little carbolic and oil, or tar, in the hole. The clinches should be short. Make a slight mark underneath with the edge of the rasp, which will allow them to fit in neatly and strongly. After clinching the nail there will be a little horn at the toe that should be rasped off, but on no account use the rasp above the nails. It is a common practice with shoeing smiths to rasp and polish the hoof right up to the coronet, but beware of the man who does this. Nature has provided a beautiful varnish for the protection of the outside walls which, if removed by the rasp, exposes the horn and causes it to crack and lose its elasticity. It is a most injurious practice, which should never be permitted. There is no objection to neatness, which can be attained by close attention to finishing and fitting the shoe and clinching carefully. The first principle in shoeing is protection. I advise all amateurs to acquire a good knowledge of the anatomy of the horse's foot. Always remember that it is not a block of wood, but a most delicate and wonderfully constructed member. A shoe should not be allowed to remain on more than six weeks. If left too long it is apt to cause contraction, corns, and other troubles. Cutting out the sole bars and frog is another cause of contraction, &c. Always shorten the foot from below and not from the front. Leave the heels of the shoe as long as possible, but discretion must be used where a horse over-reaches. Members agreed that the paper contained information of considerable value, especially in regard to the springing of the heels of the shoes, which they considered was most essential.

Mount Barker, July 16.

(Average annual ranifall, 30·93in.)

Present.—Messrs. H. N. Bell (chair), F. H. Adams, A. B. Blades, S. J. Bishop, J. Choat, C. Crompton, J. and G. Cleggett, J. F. Moore, J. Morris, D. Monfries, B. and J. Pope, B. and W. T. Stevenson, T. Simper, J. Frame, A. Ferguson, L. Hughes, H. Jones, J. Little, A. Liebing, J Thomas, J Wilks, E. P. Mappley, C. G. Brendler, J. E. Smith (Hon. Sec.), and one visitor.

Criticism of Address by Director of Agriculture.—Discussion took place concerning Professor Lowrie's address at the previous meeting.

Lime.—Mr. J. Frame had found considerable benefit resulted by applying 3 tons of lime to one and a half acres of lucerne Mr. J. G. Thomas believed with Professor Lowrie that lime was very much needed in the Hills districts. Some years ago it was used round the township, but it was very much cheaper then. He thought that farmers might co-operate with advantage. Mr. Pope had tried lime and shells on peas, and the result was so marked that a farmer who was driving past called in to ask what they were using. They intended to go in for experiments on a larger scale. Mr. B. Stephenson said the local lime was far superior to that from the Peninsula, and they could therefore do with less of it. Mr. Jones advised running it through the drill by itself the year after peas had been grown on the land, but Mr. Pope thought they would get better results by putting it in with the pea crop. He also thought better results would be obtained by evenly distributing the lime instead of putting it in furrows.

Manures.—Mr. Frame considered bonedust one of the best manures for the district. Super. had not given much satisfaction with hay or pea crops. Thomas' phosphate he had used with good results. He drilled the bonedust in with the wheat. Mr. Pope thought that bonedust would not pay on a cereal crop only, but might if used for a rotation.

Drainage.—To cope with surplus water Mr. Frame recommended ploughing up and down hill, but Mr. Pope considered that this would lead to loss of soil, which could be ill afforded.

Wheat.—Mr. Frame spoke highly of Comeback for grain, hay, and chaff. For hay he also recommended Bobs and Crossbred 53, but the latter did not come away very quickly. Mr. Pope favored late wheats. Comeback he considered good for show and for its flour, but that was all. He favored Crossbred 53, Correll's No. 7, and Leak's Rustproof. Mr. B. Stevenson liked King's Early. With him it had done better than Leak's Rustproof. Golden Drop had yielded him 2½ tons to the acre. Mr. Jones avoided bearded wheats because of injury to horses' mouths Bobs he liked for hay and chaff;

Le Huguenot also did well. Mr. A. B. Blade and Mr. Simper spoke highly of White Tuscan. Opinions were divided as to whether White Tuscan would be badly affected by rust Messrs. Frame and Pope were emphatic in the opinion that the agriculture of the district generally was of a much higher standard than that of years ago.

Port Elliot, June 21.

(Average annual rainfall, 20·33in.)

PRESENT.—Messrs. J. Brown (chair), J. Chibnall, D. J. Gordon, W. Squires, H. Green, J. McLeod, G. J. Snell, and W. E. Hargreaves (Hon. Sec.).

IRRIGATION.—Mr. J. Brown, who for 30 years had made a practice of irrigating on a small scale, read a paper. Small areas of from one acre to 20 acres intended for irrigation, should be graded to a fall of about 6in. in one chain, the water being flooded on to the land by means of pipes. The selection of the pumping plant was a matter that required very careful consideration. The size of the piping in relation to the pump was a subject on which there was considerable difference of opinion. He thought nothing less than a 4in. pipe was necessary for a 3in. pump. In reply to questions, he said that for potatoes he generally distributed about 8in. of water in four waterings, the last being three or four weeks before the tops died down. He worked the land about four times with the horse hoe whilst the crop was growing, the last hoeing being done just before the tops closed over the spaces between the rows.

PEAS.—Mr. J. McLeod reported having used 2cwts. of lime to the square chain on peas, but there was no apparent improvement in the crop. A white pea crop sown by Mr. Chibnall had been completely destroyed by magpies.

Uraidla and Summertown, July 7.

(Average annual rainfall, 44·35in.)

PRESENT.—Messrs. H. F. Johnson (chair), S. and E. Hawke, J. Rowe, H. G. Dyer, E. Hart, G. Collett, F. H. Stacey, W. Kessell, G. Prentice (Hon. Sec.), and one visitor.

GARDENERS' SUPPLEMENTARY TOOLS AND APPLIANCES.—Mr. H. G. Dyer read a paper in which he said that every gardener should have a small portable forge to effect minor repairs, and a good vice in addition to a supply of wood working tools, such as hand saw, draw knife, chisels, plane, square, brace and bits. Iron or steel heated for sharpening should be made almost white hot, but must not be allowed to burn. When tempering, the point should be dipped into water for a second or two and then withdrawn until the blue color was seen to approach the point. At that instant it should be cooled right off.

Woodside, June 18.

(Average annual rainfall, 31·95in.)

PRESENT.—Messrs. P. Keddie (chair), F. Baldock, W. King, H. Rollbusch, G. J. Sampson, J. Keen, C. W. Fowler, J. Morcom (Hon. Sec.).

FARMYARD MANURE.—In a short paper on this subject Mr. Disher recommended farmers to heap farmyard manure on the site of an old stack or pea threshing floor. The heap should be commenced small, being gradually increased in size until a height of 6ft. had been attained, when it should be raked in until it was raised to about 10ft. in height at the top. Cleanings from the pigsties placed around the bottom would effectively keep the fowls from scratching at the heap. The manure should not be left in heaps in the paddocks (this would probably result in rank growth), but should be spread immediately. The acid contents were then evenly distributed over and washed into the ground with the first rains. Land intended for potatoes should be manured and ploughed some time before being planted, a good plan being to sow peas with the manure and plough the crop under before putting in the potatoes.

SOUTH-EAST DISTRICT.

Frances, July 12.

(Average annual rainfall, 20·74in.)

PRESENT.—Messrs. McGillivray (chairman), Tompkins, Baldock, Holmes, Pfitzner, Cooper, and Feineler (Hon. Sec.).

PRICE OF CORNSACKS.—Mr. Pfitzner considered that the price asked for cornsacks was extortionate. The price had gone up from about 4s. to 8s. during the past few years, and though adverse seasons had been reported in India, if an official inquiry were made he thought failure of production might not be the greatest cause of the rise. All present favored an official inquiry.

GRASSING PADDOCKS AFTER CROPPING SEVERAL YEARS.—It was reported that paddocks cropped for several years, when left out, had very poor crops of grass, excepting silver grass, which grew abundantly. The Chairman stated that a neighbor of his had seeded, last year, English rye grass with his cereal crop, resulting in a splendidly grassed paddock after the crop had been stripped. The season was very favorable for grass crops last year. Mr. Cooper stated that paspalum grew well in sandy and light soils, but as it was so succulent the sheep ate it down too hard, and it could not make much growth. The Hon. Secretary had a paddock of Italian rye grass which supplied a great deal more feed than the paddocks of natural grass. It was considered that Italian rye grass, being a biennial, was not so suited for pastures as the English rye grass, which was a permanent grower. The Hon. Secretary had been advised to put in Italian grass as it grew a greater quantity of feed in a shorter time, after two years of feeding to let it go to seed, and work the ground well and put in a cereal crop. The next season would result in a better crop of rye grass, and the cereal crop would not have suffered. He had two plots of rye grass in this year as a test, one of 35 acres put in at rate of 12lbs. to 15lbs. Italian grass and 80lbs. super. to the acre, with 1¾bush. of Algerian oats; both the grass and oats appeared to be growing well. The second plot of 20 acres, seeded with a bushel of wheat, 1cwt. super., and 12lbs. English grass was just coming up. Mr. Pfitzner stated the rye grass did not grow well in heavier soils, as the dry weather cracked the surface and parched the roots.

Glencoe, July 16.

(Average annual rainfall, 33·84in.)

PRESENT.—Messrs. A. Dow (chair), J. Dow, J. and W. Holloway, J. T. Halliday, F. A. Telfer, W. D. Mitchell, and G. F. Ferguson (Hon. Sec.).

PLOUGHS AND PLOUGHING.—Mr. W. D. Mitchell read a paper on this subject. After tracing the development of the plough from the wooden implement of the early days, he said that the present day ploughs could be separated into two types, those which were simply required for breaking up the land for further cultivation, and those which cut a furrow to a required measurement, as was the case with the one used on land for potato-planting. Good ploughing could only be done by laying the area out in proper lands, carefully measured, and struck out as nearly straight as possible. A straight course could not be kept with a plough imperfectly set. Mr. A. Dow preferred short mouldboards, but Mr. Ferguson said these would not turn the furrows in stiff land. Mr. W. D. Mitchell said the Glencoe land was very good for ploughing, but in some of the stiff Mount Gambier soils, which carried a heavy sward of grass, it was necessary to pack the furrows well, or they would turn back, perhaps for a chain or so at a stretch, behind the ploughman. With a double-furrow plough, with a shifting dibber, and cutting a 10-in. furrow, it was possible to treat three acres in a day. Mr. J. Dow thought some types of modern gang ploughs were too light. Mr. F. H. Telfer had done good work in fallow with a three-furrow implement drawn by three horses. Members generally favored three-furrow ploughs for potato-planting, on account of the saving in labor effected. Mr. J. T Halliday preferred the single furrow.

FEEDING-OFF EXPERIMENTS.—Mr. A. Dow referred to the Government experimental plots on his farm, which had been sown with various grains for green feed on March 28th. Towards the end of May he had turned 10 cows on the five acres for 22 days. They ate down the unmanured plots before grazing the others to any extent. Mr. G. Ferguson said the acre plots on his farm had been sown with Algerian oats, Cleveland oats, Cape barley, rye, and Baroota Wonder wheat, and half of the area of each plot had a few pounds of vetches sown with the other seed. The wheat had made the best growth, but he did not notice that the stock showed any preference, except that they did not eat down the rye so bare as the other plots. He had grazed 75 sheep on the plots for 14 days, and since they had been removed all had made rapid growth, except the Cleveland oats, which he did not think would prove suitable for feeding purposes.

Keith, June 21.

(Average annual rainfall, 19·20in.)

Present.—Messrs. J. McIntyre (chair), J. B. Makin, J. A. Lock, W. H. Morcom, F. W. Schultz, W. Fulwood, E. J. Hutchings, E. Leishman, jun. (Hon. Sec.), and one visitor.

Seed Wheat.—Mr. F Packer read a paper in which he emphasized necessity for carefully grading wheat intended for sowing. Every three years it was advisable to procure fresh seed, that from the North, from which he had secured up to 5bush. per acre above returns from locally grown seed, being recommended. Federation, Bluey, Yandilla King, Purple Straw, Lotts, Bunyip, and Gluyas would do well in this district. Some of the varieties mentioned would mix well with Le Huguenot for hay. Farmers should exchange varieties with men in other districts upon whom they could rely for clean seed. Members generally agreed that Federation, Lotts, and Bluey were good varieties for this district. Several had obtained good results from Comeback and Clubhead. Le Huguenot, when sown with oats, made chaff of good quality.

Naracoorte, June 14.

(Average annual rainfall, 22·60in.)

Present.—Messrs. L. Wright (chair), W. H Smith, W. E. Rogers, F. Holmes, A. Caldwell, W. Loller, C. Bray, and S. H. Schinckel (Hon. Sec.).

Rotation of Crops.—In introducing a discussion on this subject, Mr Loller said the South-East was more suitable than the North for a system of rotation of crops, and continuous cropping, on account of the heavy rainfall. When dealing with new land that was somewhat sour, he would first sow it with oats in March or April. The working it received in connection with this crop would fit it for a wheat crop to follow. Barley could then be put in as a third crop, and rye could follow. The weeds germinated early, especially if the land were lightly skimmed, and they could be fed off with sheep. The rye crop should be followed by peas, which would raise the nitrogen content of the soil. This rotation had been very satisfactory on his land, and he believed the continuous cultivation would go a long way in the eradication of sorrel The Chairman had always found that oats did better following wheat. If the land were very stiff he might sow oats first and cut the crop very green for hay. If that was not done the wheat crop following would be dirty. With modern implements it should be possible to get a good seed bed for wheat, even in new land. He advised a crop of wheat and then oats, and after the land had been left out, a fodder crop, such as turnips. Five or six grain crops in succession would probably leave the land sick. It would become very dirty, and sorrel would be troublesome. After root crops he would leave the land under grass for a year or two. Land in Penola had been cropped 13 times in succession with oats, no manure being used, and the last crop was a good one, but the owner always took care to cut the hay green. It was the ripening of crops that exhausted the soil. He believed in growing a number of oat crops in succession on the strong black soil, such as that in the Bool Lagoon country. Mr. W E. Rogers thought it unwise to grow more than three grain crops in succession. After grain he would put in root crops or peas, which would replace to some extent constituents taken out of it by the grain crops. Mr. Bray said oats on new ground did better than wheat. The best time to deal with sorrel was in January and February. If a man sowed 100 acres with rye he would very likely find a lot of it on his hands. He raised 20 or 30 bags a year, and had as much as he could do to get rid of it. Wheat and oats were always saleable. Mr F. A. Holmes agreed that as a general rule oats should follow wheat. Cutting oats green for hay was a great point in maintaining the fertility of the land. Mr. Smith thought there would be difficulty in getting rid of a crop of rye, but peas would sell readily. Successive crops of oats would check sorrel. He had grown peas and maize, and had obtained good crops of oats and wheat after peas Mr. Schinckel said grain crops exhausted the land of potash, and this constituent had to be returned to the soil. He would sow peas first, and then wheat and oats. There was more money in wheat, and that was the reason farmers stuck to this crop. Kale, rape, sorghum, and maize could with advantage be included in the rotation Wheat following maize did remarkably well. Mr Loller, in reply to criticisms, said his remarks on rotation of crops had more to do with the larger crops for which they had a ready market, and he did not take into consideration sorghum, maize, &c. Farmers did not sow these to any extent. Such crops would not grow as well in the South-East as in the northern portions of the State. They had not the quality of soil in this part, and rich manures were needed for maize and sorghum. He would put in oats first in new land which needed sweetening, as they could be grown on land where wheat would not do well.

Exhibits.—Mr. Loller tabled samples of wheat and rye grown for green feed. The seed had been sown in March with 1cwt. of guano to the acre. The rye had been drilled in, and the wheat cross drilled, and at the time it was cut, during May, it had attained a height of between two and three feet.

Penola, July 5.

(Average annual rainfall, 26·78in.)

Present.—Messrs. H. Richardson (chair), A. H. Strong, A. E. Lampe, D. Adamson, S. L. Norman, J. Redman, D. A. Fullerton, P. H. Kilsby, W. Miller, H. Ricketts, and S. Ockley (Hon. Sec.).

Eradication of Dock.—In reply to a question, Mr. P. H. Kilsby said that the only method to cope successfully with dock was to pull it and burn it. Mr. Fullerton said on hard ground it could be lessened considerably by hoeing, provided all the roots hoed up were burnt and not allowed to lie on the ground.

What to Sow with Rape.—Mr. Adamson said rape alone sown in September did not seem a satisfactory crop for sheep. It needed something else mixed with it. Vetches were recommended by those present.

Breeding Comeback Sheep.—Mr. Fullerton said that to breed Comeback sheep Lincoln rams should be used on Merino ewes, the progeny being known as first cross. On the first cross ewes use a Merino ram and the resultant flock would be Comebacks. They were usually good doers, and besides cutting a valuable fleece of wool, though light, they afforded an excellent carcass when fattened. Great care should be exercised when the Merino ewes were lambing to the Lincoln rams, as the lambs generally possessed the large head typical of Lincolns. He would never use aged maiden ewes for this purpose, because this would result in great mortality among the ewes. Four-tooth ewes were the best, as they apparently were not so set in the bone as the older ones. If Romney Marsh rams were used instead of Lincolns, the trouble at lambing was minimised, and the lambs obtained would mature more quickly, although when full-grown sheep the cross from the Lincoln might be larger. First cross ewes were without doubt the best mothers, as they possessed more milk than Merinos, and consequently were not so apt to desert the lamb. One line of Merino ewes he had were so bad that he was obliged to build a brush yard in which to put many of the ewes, and kept them there until they took to their own lambs. It was much better if a fairly small enclosure were available to put such ewes in. When helping a strong ewe to lamb, it was a mistake to pull the lamb right away, because being strong the ewe was apt to get up at once and run away. After the head and shoulders were free the ewe should be left. She would have no trouble in completing parturition. It was fatal to assist a ewe unless she was straining. When a ewe showed signs of weakness and experienced a difficulty in rising, it was wise to wait till she had lambed, and then help her to her feet and walk her about till she was able to go unaided. If Merino rams were used on Lincoln ewes to obtain the first cross the progeny did not seem to have the same uniformity as the universal method advised. Mr. Adamson had often slung weak ewes up to a wire fence to allow the lamb to obtain nourishment and the ewe to regain the use of her cramped limbs.

Tape Worm in Lambs.—Mr. Fullerton thought that a change of pasture was the only remedy for this complaint. A local sheep station had a large number of lambs afflicted with tape worm. They were turned into a paddock of freshly-burnt scrub, and in a few weeks the change was marvellous and the flock completely recovered.

Tintinara, June 28.

(Average annual rainfall, 18·78in.)

Present.—Messrs Donaldson (chair), C. M. Ives, Scott (two), Bell (three), Koeppen Wendt, Northcott, Stead, D. T. Kennedy, J Helling, Henderson (two), Bainger, C. P. Hodge, M. F. Hodge (Hon. Sec.).

Fallowing.—The following paper was read by Mr. D. Bell: "New land intended for fallowing should be logged between November and January. A suitable log for this work is one 18ft. or 20ft. in length and about 18in. in diameter. This can be worked comfortably with six horses and two drivers, and should break 35 acres a day in light mallee or heath country. To ensure a clean burn the mallee land sould be gone over twice, but with the heath I hardly think this necessary. I consider February the best month in which to burn off. If left later rain may prevent a clean burn. Experience has convinced us, as well as others in this district, that a fire break is necessary. To prepare this, cultivate very lightly a strip 12ft. in width, then rake it with an ordinary horse rake. This will make a clean break when ploughed. Ploughing should be started immediately after seeding is completed, not later than the middle of June. In heath country plough to a depth of 8in., and so drag out most of the yaccas. The next working should be done with a disc cultivator or harrows about the end of August or the beginning of September. The disc harrow is preferable to the ordinary harrows for this class of land, on account of the fibrous state of the ground. Another working with the same implement before harvest is necessary. In mallee land ploughing to a depth of 5in. is sufficient. It will pay better to grub the yaccas, which are few on this land as compared with the heath, than to plough to a greater depth. Harrow twice directly ploughing is finished, and cultivate before harvest with a disc cultivator. For fallowing old heath land I prefer the disc cultivator, turning the land to a depth of 4in. being all that is necessary. The following working should take place not later than the middle of August to a depth of 2½in. This can be done with a disc harrow or skim plough. If any weeds are cut during the second working the harrows should follow immediately after. Should rain fall during the summer months the opportunity of getting the team to work on the fallow should not be missed. Dry working, in my opinion, is a great mistake, unless on ground intended for summer fallowing, *i.e.*, land ploughed between harvest and seeding, and left until the following year before being cropped. By adopting this method more land can be put under fallow each season. When practised on dirty land, all weeds start with the first rains and can be killed during the winter and spring months while the ground is wet."

* * *

Shipping Wheat, Wallaroo.

AGRICULTURAL PUBLICATIONS.

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

Vinegrowers' Manual, by A. Sutherland, 6d.; posted, 7d.

Reports of Conferences of Australasian Fruitgrowers held at Brisbane and Wellington, 1s. each, or 1s. 1d. if posted.

Journal of Department of Agriculture of South Australia, 1s. per annum in advance; 3d. per single copy to residents of South Australia; 2s. 6d. per annum to other places.

Any of the following Bulletins and Leaflets may be obtained by sending a penny stamp for postage:—

Agriculture, Miscellaneous: Agricultural Bureau Congress Reports; Agricultural Experiments; Amount of Spirits to be Extracted from a Ton of Raisins; Depth of Sowing of some Agricultural Seeds; Housebuilding in New Districts; Lucerne Cultivation and Management; Milling Experiments; Reclamation of Land; Roseworthy College Farm Flocks; Roseworthy College Harvest Reports; Roseworthy College Permanent Experimental Field; Stage to Cut Wheaten Hay; Trial of Stone-Gathering Machines; Salvation Jane or Paterson's Curse.

Horticulture: Apple Mussel Scale; Bordeaux Mixture; Cidermaking; Curculio Beetle; Codlin Moth; Currant Industry; Fertilisation of Orchard Lands; Fruit Drying; Fruit Flies; Fruit Preserving; Grape Vine Mildews; Gumming Disease of Peach and Almond Trees; Selection and Planting of Fruit Trees; Irish Potato Blight; Peach Leaf Curl Fungus; Plums and Prunes; Preserving, Canning, and Drying Fruits; Production of Early Tomatoes; Remedies for Diseases of Fruit Trees and Vines; Some Notes on Almonds.

Dairy: Milking of Cows; Spaying of Cows; Taints and Flavors of Dairy Produce; Taints in Milk and its Product.

Stock: Branding of Stock; Stomach and Bowel Diseases of the Horse; Bot Flies and Bots.

Beekeeping Notes.

[Every farmer and fruitgrower should join the Agricultural Bureau. Write to Department of Agriculture for particulars.]

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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Use of Artificial Manures.

The Government Statist (Mr. L. H. Sholl, C.M.G.) has issued interesting and instructive tables showing the percentage of the land under crop in South Australia in the seasons 1911-12 and 1912-13 which was manured, and the quantities of manure per acre actually used on the average by the farmers in each division of the State. The tables, which were compiled from returns supplied by farmers and are sufficiently explanatory, are printed below :—

AREA.

Division.	Total Area Under Crops of All Kinds.		Area of Cropped Land Manured.	
	1911-12.	1912-13.	1911-12.	1912-13.
	Acres.	Acres.	Acres.	Acres.
Central	1,004,631	1,027,553	846,673	866,017
Lower North	741,668	781,467	670,525	701,815
Upper North	324,113	295,305	184,018	175,839
South-Eastern	385,594	419,420	330,804	358,761
Western	508,077	538,080	462,753	485,601
Outside counties	1,255	1,173	—	100
Total	2,965,338	3,062,998	2,494,773	2,588,138

QUANTITY.

Division.	Quantity Manure Used.		Average Quantity Used Per Acre.	
	1911-12.	1912-13.	1911-12.	1912-13.
	Tons.	Tons.	lbs.	lbs.
Central	34,398	36,900	91·0	95·4
Lower North	24,891	25,670	83·2	81·9
Upper North	5,222	5,147	63·6	65·6
South-Eastern	10,308	10,883	69·8	68·0
Western	12,656	13.005	61·3	60·0
Outside counties	—	2	—	44·8
Total	87,475	91,607	78·6	79·3

In addition, 16,357 acres were manured with 134,503 loads of stable manure in 1911-12, and 15,003 acres with 111,434 loads in 1912-13.

Conference of Hills Branches.

The annual conference of the Hills Branches of the Agricultural Bureau will be held at Mount Barker on Monday, October 13th. The Director of Agriculture (Mr. Wm. Lowrie, M.A., B.Sc.) has been asked to address the gathering, and among the other officers of the Department who will be present are the Horticultural Instructor (Mr. Geo. Quinn), who will speak on "Some Points in the Care of the Orchard," and the Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), who will invite the attention of Conference to a subject relating to diseases of stock. The activity of the Mount Barker Branch is a guarantee that the arrangements will be well thought out, and that the proceedings generally will be both interesting and instructive.

Poultry-Keeping in Ireland.

Poultry-keeping in Ireland is primarily a woman's industry, says the *Journal of the Board of Agriculture.* Its regeneration has been effected in no small degree through the agency of women. During the past 12 years the educational work has been carried out almost exclusively by women teachers. The success of this systematic attempt to improve the conditions of poultry-keeping in Ireland may be gauged to some extent by a consideration of the increase in exports. During the period from 1904 to 1910 the *average yearly increase* in the value of eggs, poultry, and feathers exported from Ireland amounted to £720,000.

Opossum-Farming.

The newest West Australian industry, so far as the land is concerned, says *The Geralton Express*, is that about to be started by Mr. Lance Le Souef, younger brother of the Director of the Perth Zoological Gardens. Mr. Le Souef is about to start an opossum farm somewhere down in the South-West timber country, and it is reported that he intends to begin operations by importing about 1,000 or 1,500 black opossums from Tasmania. Mr. Mitchell (ex-Minister for Agriculture) once said that he could tell the wheat-growing capacity of the soil by looking at the tops of the trees. If Mr. Le Souef's scheme works well the only possible way to tell the stock-carrying capacity of land will be by looking at the tops of the trees. The Sydney Le Souef is the originator and advocate of the 'possum-farming idea. According to him, 'possums will beat any other kind of stock out of sight as profit producers. At present, however, no one knows how many 'possums to the acre our land will carry.

Largest Walnut Tree.

Yula City, says the *Pacific Rural Press*, has the distinction of having within its limits the largest walnut tree in California, and in all probability in the world. It is known as a Paradox walnut, a cross between the Northern California black walnut and the English walnut. The circumference of the trunk 4ft. from the ground is 15ft. 4in., while the greatest spread of branches is 108ft. The height to the square of the top is 99½ft., and the extreme height to the top of the topmost limb is 103ft. The tree was planted at least 40 years ago, but though it bears a considerable crop of nuts each year, the quantity is insignificant when compared with its size.

Price of Wheat in the United Kingdom.

Statistics issued by the Board of Agriculture and Fisheries show that the average price of wheat in the United Kingdom in 1912 was 34s. 9d. per Imperial quarter, being 3s. 1d. higher than in 1911 and 1910. If the average price (36s. 1d.) reached in 1909 be excepted, the price in 1912 was the highest since 1891, when 37s. was recorded, while all the annual averages from 1885 to 1890 were also lower than in 1912.

Prices of Barley and Oats.

The average price of barley in 1912 was 30s. 8d. per quarter, 3s. 5d. higher than in 1911, and 7s. 7d. higher than in 1910. The 1912 average was the highest recorded since 1884, when the price was the same. The average price of oats in 1912 was 21s. 6d. per quarter, being the highest since 1882.

Co-Operative Dairies.

One of the happiest consequences of the foundation of co-operative dairies in France, says a bulletin of the International Institute of Agriculture, has been the profitable utilisation of the subproducts of milk, which previously brought in nothing or practically nothing to the farmers, in spite of scientific treatment. The dairies have, for example, established pigsties and have given themselves largely to the improvement of pigs, and thus find a profitable use for their whey. Some of the societies have been formed solely for the utilisation of the subproducts of milk.

Potato-Spraying.

Attention to the results of spraying potatoes for several years at the stations of the Irish Department of Agriculture is called in a leaflet. This shows that in each of five years washing soda with sulphate of copper increased the yield of crops to a greater extent than where lime was used. The average increase was 2½ tons where the soda was used, against 1 tons 14cwts. where lime was in the mixture. The contention is that the soda mixture sticks on the leaves better than the other. The directions for preparing the former are to put 35galls. of clear water into a paraffin barrel, which holds 40galls., and to suspend in a piece of coarse canvas 8lbs. of sulphate of copper just below the surface of the water, which is the best way to dissolve it when boiling water is not used. Then 10lbs. of washing soda should be dissolved in another vessel in boiling water and made up to 5galls., to be added to the other solution immediately before being used. The two solutions can be kept for days separately, but would deteriorate if mixed many hours before being used. When mixed, the stuff should be tested with a piece of litmus paper. If the paper turns red, more soda should be added until the paper when dipped in the mixture remains blue.

Co-operation—A Lesson from California.

The orange and lemon crop in California is about 50,000 carloads annually or 20,000,000 boxes, produced by over 10,000 growers. Four-fifths of the growers are organised into co-operative associations, more than 60 per cent. of which are federated into the Californian Fruitgrowers' Exchange. This is a non-profit corporation. It is managed by a board of 17 directors, one from each district of the exchange, who employ one general manager.

Agricultural Education.

The experiment stations in the United States in 1897 employed 628 persons and had a total income of £235,000, while in 1911 they employed 1,567 persons, and their income was £763,000. The number of colleges giving instruction in agriculture in 1897 was 61, the students totalling 4,000; in 1911 the 67 State agricultural colleges enrolled nearly 18,000 students, and there were also 42 privately endowed colleges giving courses in agriculture. There were only nine agricultural high schools in 1897, as against 78 in 1912. Nearly 290 public high schools receive State aid for courses in agriculture, domestic economy, and farm mechanics, and over 1,600 other high schools give instruction in these or kindred subjects without State aid. Agriculture in the elementary schools had hardly been thought of in 1897, whereas now nearly every State in the Union gives some encouragement to such teaching, and 19 require it by law.

Australian Sheep in South Africa.

At the first Annual Conference of the newly-constituted Cape Agricultural Association, which was held at Port Elizabeth on June 4th, 5th, and 6th, the following resolution was carried :—" That owing to the number of inferior sheep imported into this union from Australia, the Government should allow their experts to inspect any imported stock offered for sale at the request of farmers." Referring to the same subject, the Commercial Agent for the Commonwealth, in a report to the Department of External Affairs, states—At its last meeting the Cape Stud Book Society decided to urge the Government of the Union to insist upon inspection at the ports of all imported sheep and their grading into first, second, and third studs, and first, second, and third flocks. The idea was that they should be numbered by a brand " with a view to preventing inexperienced buyers from paying a high price for sheep not worth the money." The society also decided to urge that a South African stud-breeder should be appointed as inspector.

Victorian Fruit Yield.

A return issued by the Victorian Government Statist (Mr. A. M. Laughton) shows that the yield of apples in Victoria for the season 1912-13 was 2,036,756bush. Pears gathered represented 669,898bush., plums 260,830bush. peaches 289,731bush., and apricots 138,881bush. ; other descriptions raising the total to 3,775,400bush. On the area growing fruit for sale 6,285 growers dealt with 59,119 acres

United States Department of Agriculture.

The development of the Department of Agriculture in the United States during the last 16 years and the manifold nature of its operations are shown in the report of the Secretary of Agriculture for 1912, contained in the Department's Year Book. The following will illustrate the growth of the Department in certain directions :—The expenditure in 1897-8 was £682,000, it increased to £1,481,000 in 1905, by 1912 had risen to £4,352,000, and for 1913 is set down at £5,155,000. The staff of the Department has grown from 2,444 persons in 1897 to 13,858 in 1912, and while in 1897 the different publications printed were 424, of which 6,541,210 copies were issued, in 1912 the publications numbered 2,110 and the copies issued 34,678,557.

The Blow-Fly Pest.

A writer in the *Queensland Agricultural Journal* recommends arsenic water of the strength of 1lb. arsenic to 30galls. of water for the purpose of poisoning offal, dung, &c., upon which the flies blow. Thousands of flies are said to be destroyed in this way.

The Importance of Tillage.

Behind every big crop you will find the stuff that made it grow. It may not be all in the form of a fertiliser, but wherever there is a big crop there must be the abundance of available elements to produce it. There are other things than fertilisers that make crops grow. If you are in the field when the crop that makes the remarkable yield is planted you will usually find it is deep and careful ploughing, and repeated harrowing, rolling, and dragging that produce a perfect seed bed—firm below, free from clods, fine on the surface to hold moisture during drought. Continue to watch this crop, and you will find that the tillage is frequent and careful, that there is an extra dose of fertiliser added just before fruiting time. The invariable tendency is to hasten seeding by neglecting tillage, and quite as invariably it is a msitake. A few days in planting have little to do with the yield of crops, but an extra harrowing of the seed bed may mean a great deal. If you must skimp on tillage, do it after the crop is planted, but have conditions right at the start.—*Country Gentleman.*

Soy Beans.

The soy bean is a large bushy plant 3ft. to 6ft. high, maturing in 90 to 135 days. Meal from these beans analyses at least 35 per cent. proteins, 18 per cent. fat, with little indigestible matter. Culture is simple, 1½bush. broadcast or for seed at 4in. intervals in 2ft. rows. Yield, 25bush. to 35bush. per acre ; 1bush. equal in feeding value 2bush. maize. It may follow wheat, but is better after a nitrogenous crop, *e.g.*, lucerne.—*American Agriculturalist.*

Shipping Wheat, Wallaroo.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquirers received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. Place, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

"T. H. S.," Peake, has a five-year-old mare with swelling on side of nostril, which discharges stinking matter, at times shrinks, swells again, bursts, and so on. There is history of a kick. He asks for advice.

Reply—The kick injured a bone, the splinters of which cause the trouble; the wound must be opened and the cause removed, it will then probably heal quickly under ordinary wound treatment.

"J. J.," Forster, asks how to treat a young horse very lame in off side hock, resulting from a sudden jerk at a fence.

Reply—Apparently there is a severe strain of the ligaments and tendons on the inside of the hock. Treatment—Hand rub as often as possible, foment with hot water frequently, apply a lotion made of tincture arnica, 1oz., methylated spirit, 1 pint.

Goode Branch fears that if strychnine is used for rabbits it gets into the bones, and is dangerous to cattle.

Reply—There is some little risk of cattle eating rabbits containing enough poison to be dangerous, but from a practical standpoint, if the cattle get enough natural food to eat the risk may be ignored.

Spalding Branch asks if the red worm found in water troughs is the same as blood worms in horses.

Reply—No; these red worms are harmless, and are digested by the horse; blood worms hatch out in the mud of dams and creeks and are very tiny, white, hair-like worms in their early stage.

The same Branch asks if the action of sulphate of iron, when dissolved in an ordinary or galvanized trough, creates a poison through contact with the iron or galvanized part.

Reply—No ; at any rate, not in the quantity likely to be used.

" Higgerhunt " wants treatment for a four-year-old draught colt passing threadworms.

Reply—Give an enema of a quart of warm milk, two tablespoonfuls of ordinary turpentine, and four tablespoonfuls of glycerine, this will shift the worms that live in the hind gut Probably a drench of a pint of raw linseed oil and two tablespoonfuls of turpentine would shift other worms as well. Give an ounce of salt a day in the feed, and half an ounce of flowers of sulphur once daily for a fortnight.

" S. B.," Warcowie Branch, asks how to treat a two-year-old colt which seems in good health, but has lumps all over it, which vary from time to time, but do not seem to cause it any trouble.

Reply—The animal's blood is out of order ; ¼oz. flowers of sulphur and ¼oz. cream of tartar given once a day in a little food for a fortnight should bring about an improvement.

" J. W.," Wanbi, has a 10-year-old gelding that paws in his stall at times and when loose or in harness, and wants to lie down as if in pain.

Reply—The horse is probably suffering from sand or other intestinal irritant. It would be well to try for sand by giving a quart of new milk or strong coffee.

Green Patch Branch wants treatment for horses having gravel—not sand, but ironstone quartzy gravel up to ½in. diameter—in their bowels.

Reply—Half a pint of castor oil with a similar amount of raw linseed oil may be given as a purge, but the condition is a most serious one, and chlorodyne or laudanum may be required with the oil. Gravel of this sort is not eaten, but swallowed with the drinking water, so that the supply should be protected by fine wire netting or other strainer.

" P.," Clanfield, has an unbroken mare which sustained a severe barbed wire cut on the leg. The wound has been treated, but not very satisfactorily, the leg being swollen.

Reply—Probably a daily dressing of a solution made by dissolving as much pure iodine as will lie on a shilling in a pint of methylated spirit will help to reduce the swelling, which is the result of growth of scar tissue.

" S. H.," Lameroo, has a light horse which struck the leg while jumping leaving a fluctuating swelling above the knee.

Reply—The swelling is an injury to the oil sheath through which the muscle runs. Treatment—As much hot water and hand-rubbing as can be put in every day, followed by a little oleate of mercury, 10 per cent., well rubbed in every evening.

" D. H. C.," Balaklava, has a six-year-old mare suffering from intermittent colicky pains, which continue in spite of treatment.

Reply—Probably a preparation of three days on bran mashes only, followed by a six-dram aloes ball, would be a means of relieving her of what appears to be an accumulation in the large bowel. No work for three days after.

" A. F.," Willowie, has a mare with a rough, fleshy growth on the eyelid.

Reply—This is somewhat similar to a cancer, and originates from the irritation of flies and dust. Treatment is removal by a knife, no other is of any use. If no veterinary surgeon is available, the mare may be thrown, a little 5 per cent. solution of cocaine poured into the eye, and the whole mass with the part of the eyelid it is on cut away, afterwards the eye should be kept clean and a little boracic acid blown on to it every day till well.

Booleroo Centre Branch asks—Is bluestone pickled wheat injurious to horses or poultry ?

Reply—In feeds of 3lbs. or 4lbs. it is often used with good effect as a worm remedy for horses, but if constantly fed would prove harmful after a time. With regard to poultry, it depends entirely on the amount eaten whether it would do harm or not.

" H. H. W.," Pinnaroo, asks for prescriptions for—(1) A general application for cuts caused by barb wire, or for similar injuries ; (2) sand ; (3) colic.

Reply.—(1) A drachm of pure iodine, practically as much as will lie on a shilling, dissolved in a pint of methylated spirit, will be found a very useful follow by 10-drop doses of veterinary tincture of nux vomica twice a day for a fortnight. As a preventive plenty of water and soft food, either green or application. (2) Drench the horse with a quart of new milk or of strong coffee made with milk, grounds and all ; repeat in a few days if necessary ; mashes. (3) Half a pint of gin with a wineglassful of peppermint and half a pint of warm water ; or a pint of raw linseed oil and two tablespoons of turpentine ; or a teaspoonful of household ammonia in half a pint of cold water ; or an ounce of baking soda in a pint of strong coffee. Any of these will be found useful.

The Whyte-Yarcowie Branch reports that a mare in foal died after a short illness, and on a *post mortem* being made it was found that the hinder gut had become tied in a complete knot similar to that tied by a binder. A portion beyond the constriction was much inflamed.

Reply.—Gut tie is usually the result of excessive muscular action of the coats of the bowels, which are generally working slowly with a worm-like movement. This occurs after irritation, which in an in-foal mare may very likely have been caused by the movements of the foal.

" W.," Whyte-Yarcowie, states that he crutched some of his ewes to prevent fly blow, using Cooper's dip ; then, suspecting lice among the sheep, he was surprised to find them only on those not dressed. He asks if the dressing would free the others from lice.

Reply.—Probably, yes, to a certain extent ; complete dipping certainly would, or spraying. The firm in question distribute through their agents literature on both fly blow and lice. A recent pamphlet affirms the marked success of their dips as a preventive of fly blow.

Coomandook Branch inquires cause of illness of calf nine months old, which moped, went blind, and ran at nose with a slimy discharge.

Reply.—The symptoms seem to point to poverty of blood, anæmia, most probably due to parasites. Should other cases occur, 20grs. of sulphate of quinine twice a day in a pint of milk would probably help towards recovery.

" W. R. C.," Wirrabara, has a horse that was kicked just above the knee. This left a swelling, and he asks for advice.

Reply.—Probably a little oleate of mercury, 10 per cent., rubbed in daily for 12 or 14 days, will reduce the swelling.

The Morphett Vale Branch asks for a remedy for a horse troubled with thick urine. A member stated that a dessert spoonful of saltpetre dissolved in water and mixed with the chaff once a week was an effective remedy. The same Branch inquires the cause of a horse rubbing the hair off his tail.

Reply. The remedy suggested (a dessert spoonful of saltpetre in the chaff once a week) for thick urine is good ; or 10 to 15 drops of tincture on a little sugar put into the mouth once a week may be administered. The cause of a horse rubbing hair off tail is generally a kind of mange parasite. Give ½oz. of flowers of sulphur once daily in the food for a fortnight ; wash the places rubbed well with soft soap in the warm sunshine, and then daily apply with a stiff brush (an old dandy) olive oil four parts, petrol one part.

HORTICULTURE.

(Replies by Mr. G. Quinn, Horticultural Expert.)

" B. A. A.," Berri, forwarded orange leaves affected with a scale disease, in regard to which he seeks information.

Reply—The twig and leaves are affected by a species of lecanium, probably *L. Lesperidium.* It favors young, densely-foliaged orange trees and gives rise to much honey dew, upon which in turn the mould fungi thrive. Remedies—Thin out dense spots of foliage and spray with several applications of kerosine emulsion, made by emulsifying in the proportions of 1lb. soap, 1gall. boiling water, and 2galls. kerosine, and diluting one part of the mixture in 10 to 12 parts of water for spraying.

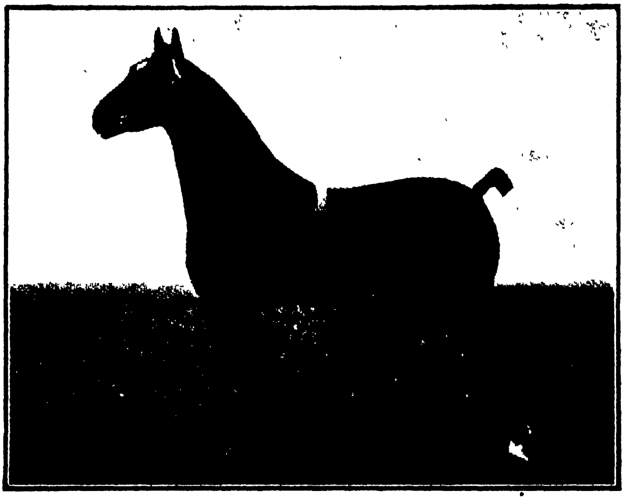
" G. H. M.," Mannum, forwards specimens of a caterpillar found in ripe oranges and lemons.

Reply—The caterpillar forwarded belongs to the Tortrix family of moths, and is probably the larva of *Cacœcia responsana*, a native leaf roller. Although some seasons it may prove troublesome amongst fruit trees and grape vines, it does not usually prove seriously destructive. Its favorite haunts are amongst clusters of newly-formed grape berries, where nectarines or plums bunch together, or when apples are touching. It frequently draws a leaf over the fruit and eats the surfaces of both leaf and fruit, rarely penetrating deeply into the pulp of the latter.

THE PONY ON THE FARM.

By F. E. Place, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.

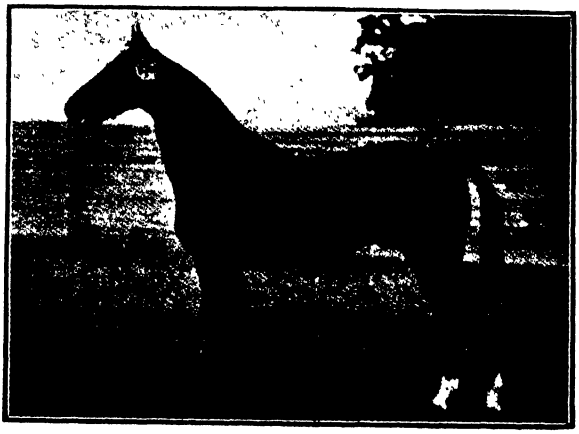
A pony, or a pair of them, is never out of place on a farm ; but sometimes one sees a lanky monstrosity of diminutive horse-flesh, with a head big enough for a draught stallion, and hoofs flat enough for meat dishes, that is too small for the team and too bulky for the sulky shafts, and lost in those of the spring dray ; and one is told that the thing is a pony. If so, the fewer the better, for such ill-judged crosses are no more ponies than they are thoroughbreds ; and should anyone be fatuous enough to possess one his return to reason would be marked when he put a bullet in its brains, or auctioned it with a glowing description and no warranty.



Three Year Old Pony Stallion.
First, Royal Show of England, 1911.

The pony is an example of the survival of the fittest under the most adverse conditions, and could a better character be wished for with any farm servant ?

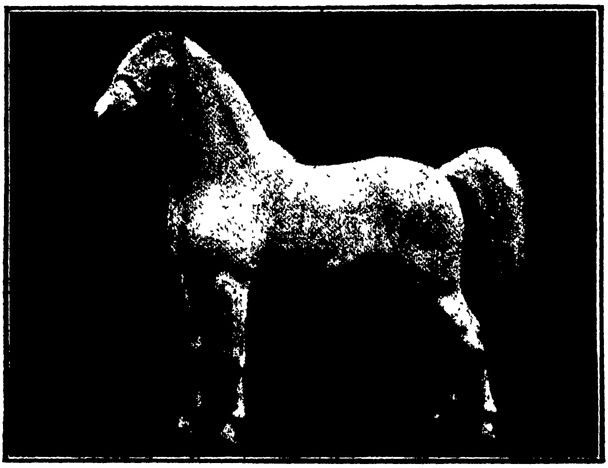
Long before the Phœnician traders tried to over-reach Cousin Jack, and failed, Britons were good horse masters and shrewd breeders. This is evidenced to-day by the old Devonshire pack horse and the Cleveland bay, many examples of which are as like as two pins, and which are described by Roman and Saxon chroniclers as the British horse, which was forced to the hills and moors with his master before the invaders' arms, and there lived the simple life of hard work and short rations. These developed the intellect if they stunted the growth, with the result that a pony is as cunning as a monkey, as docile as a child, as tough as a veteran, and staunch as a horse; he wants little to eat and never tires. He is up to any weight, despite his size, as anyone can see afield with the Devon and Somerset Staghounds on the wilds of Exmoor, where not infrequently the pony is over the bank first, ready to give his 16-stone rider a hand with his tail for a haul up the slope, when the upstanding hunter and his pink-coated mount are "pounded" in the field; while at Brampton fair one may often buy for a few shillings a Dartmoor colt that can be carried home in the railway carriage, and that in a few years will run down his 50 miles before dinner and be ready for the return ere the moon rises.



Polo Pony Stallion, "Othrae."
Champion, Royal Show, 1911.

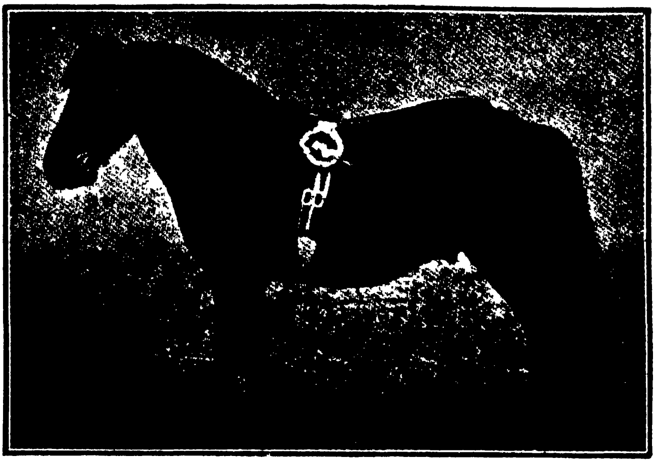
One is told in South Australia that ponies are not strong enough or fast enough for the long distance runs required of them, and yet the writer has often noticed that when the successful man of a district is proudly piloting him over his paddocks the buggy is drawn by a pair of ponies, and rattling good ones, too, as a rule. If one watches the arrivals at Onkaparinga, or any other favorite meeting, the pony teams are always there on time, and their owners do not get out of bed any earlier to do it; the little steel-wire legs have not the stride of the horse, but the pace is the same up hill and down, with always a bit in reserve if a train has to be caught.

If the children are too small to ride, it is a lot easier for mother to take them out in a pony cart than to push a pram, while the pannier will help if the country is rough. As soon as the boys and girls can straddle a saddle, off they can go to school on the pony, which comes up to call and never plays a worse trick than baulking at a mud heap for the pleasure of seeing a cocksure rider take a header into it; while if a message has to be sent a mile or two, the answer will come back much faster if it is taken on the pony, to say nothing of the pride of ownership and the increased interest it creates when "my pony" has been used for some important occasion—to fetch the doctor perhaps, or bring back the result of a successful deal. Then, as boys come back from college and the girls put up their hair, something smarter is looked for and found in the judicious breeding that has evolved a stylish pair for the buggy, or a couple of lithe active youngsters on which the boys can play a fast chukka at polo, and sell at a good profit to the sporting city man. And as the back stiffens and the hairs go grey, it is not so troublesome to throw the leg over the pony, and one is near the ground to see the weeds



Welsh Mountain Pony Stallion, "Greylight."
Champion Royal Show, 1911.

or look over the tilth without the weariness of walking. All these are the ordinary legitimate uses of the pony on the farm, but the stout little beast can do more than these. In a light dray or express the seed wheat can be delivered where it is wanted, and the hundred and one things that always seem to be at the store or station brought home without delay ; while a small-sized horse gear can be cheaply fitted to the separator or the churn, to say nothing of the washing machine or the centrifugal pump, all of which will be worn out long before the pony that supplies the motive power, while a gentleman like " Greylight " in the home paddock is always a sight for sore eyes.



Shetland Pony Stallion, "Silverton of Transy."
Many times Champion at the Royal Show.

The points of a pony are those of the horse refined, his faults are those of the horse minimised, his price is half, and his value double.

* * *

SOME ECTO-PARASITES AFFECTING POULTRY.

By D. F. LAURIE, Government Poultry Expert and Lecturer.

(*Continued from page* 18.)

Dermanyssus, Dugès. (Order Acarina—Family Gamasidæ.)

GENERAL DESCRIPTION.

Neumann says of this family, " The integument is coriaceous, partially or wholly, and has two chitinous plastrons ; a superior dorsal, and an inferior ventral which give attachment to the legs. The rostrum is arranged for pricking or sucking, the chelicerae are generally disposed as didactylous pincers, and are usually dissimilar in the two sexes ; the maxillæ are fused

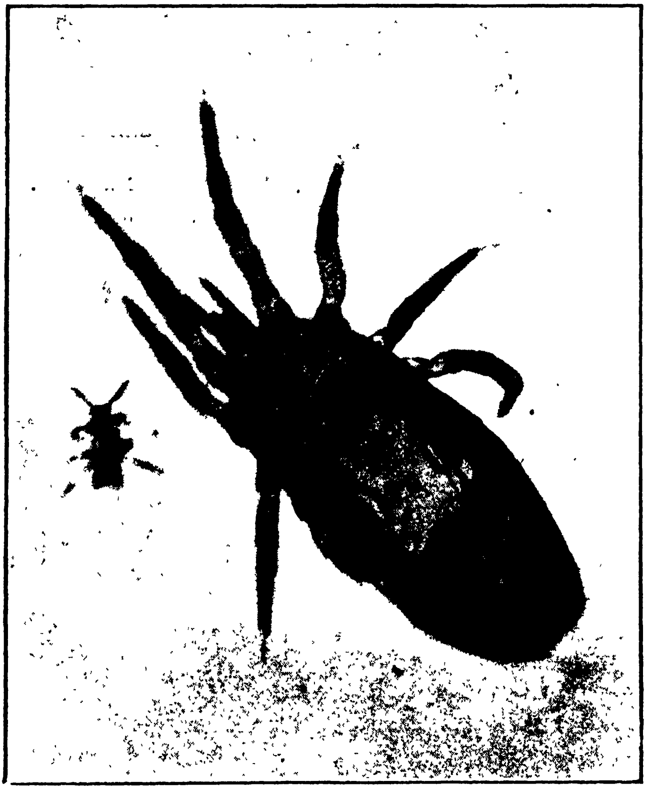


PLATE I.

into a perfect tube on the upper surface by the labrum, which is festooned; the maxillary palps are simple, free, antennæ-like, composed of five articles, and provided inwardly with galeæ or secondary palps. The legs have six

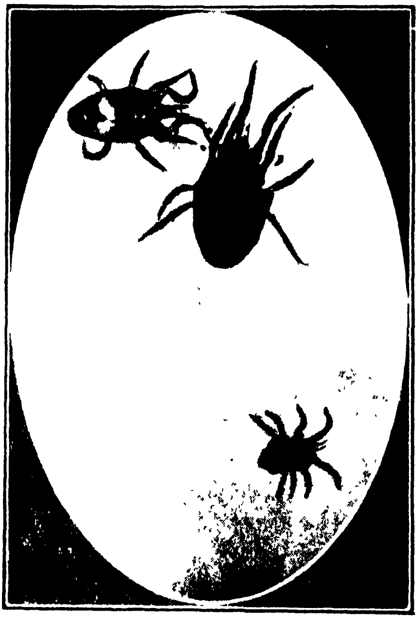


Plate II.

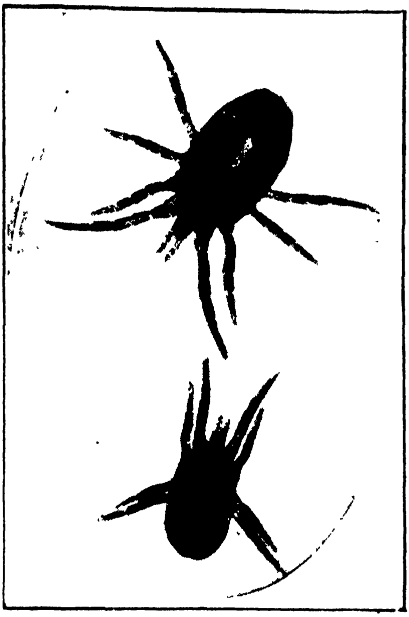


Plate III.

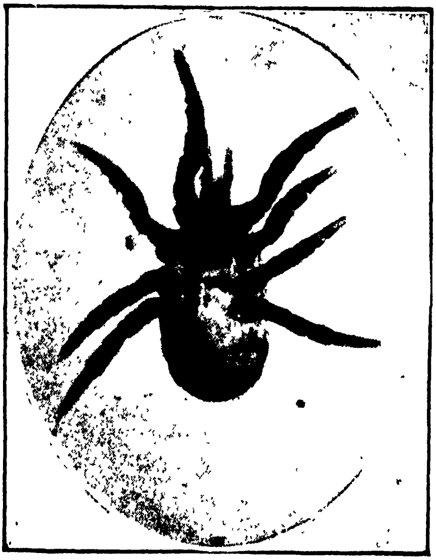


Plate IV.

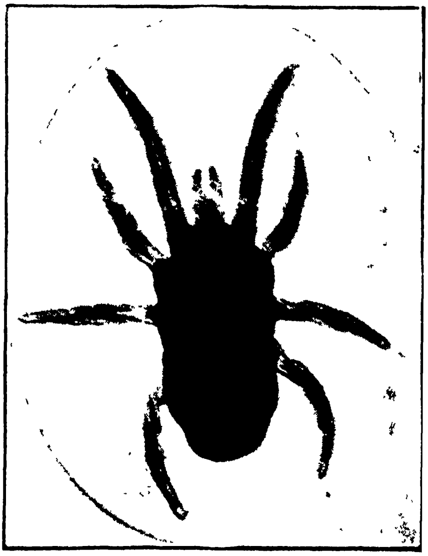


Plate V.

articles, terminating by two hooklets and a trilobate membraneous caruncle. There are two stigmata, situated near the posterior legs and protected by a very long tubular peritreme, lying along and above the haunches and opening in front. There are no eyes. They are oviparous."

This species is a partial parasite of poultry, and also extends to man and domestic animals.

Demanyssus Gallinæ, Redi.

Body ovopyriform, posterior end largest, slightly flattened from above to below; abdomen margined by short, well-separated bristles; color varying from yellowish-white or grey to blood red, according as this parasite is fasting or more or less full; the intestinal tube gorged with blood can be seen as a variously shaped figure. The ovigerous female is ·70 mm. long by ·40 mm. broad, the male ·60 mm. long and ·30 mm. broad. Many specimens, however, exceed these dimensions. The chelicerae of the female is in form of a long thin stylet, that of the male subdidactylous. The *Dermanyssus*, commonly known as the red poultry mite, is essentially noctambulatory, and in the daytime lives in cracks, under the perches, in rough walls, straw, bags, or wherever it can effect a hiding. There is no doubt that the *Dermanyssus* of birds (particularly canaries), and termed *D. Avium* (De Geer), and of swallows *D. Hirundinis* (De Geer), are identical with *Dermanyssus gallinæ*. I refrain from quoting the many cases recorded of the invasions of man and animals, but it is worthy of mention that horses and cattle may be affected with a

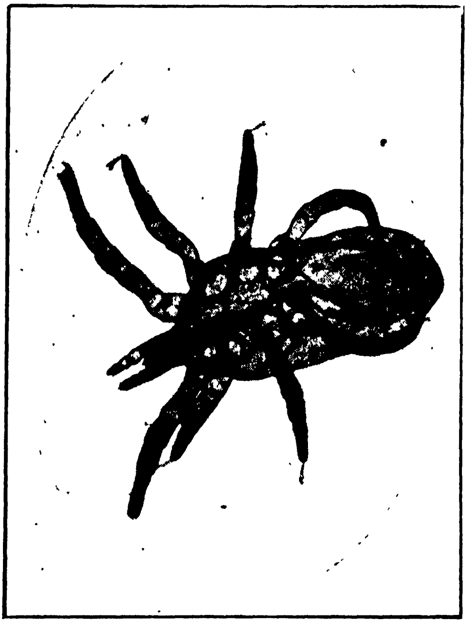


PLATE VI.

peculiar dermatosis which may or may not be serious. This trouble is due to the depredations of this pest, which, if unchecked, soon appears in countless numbers.

AMONG POULTRY.

This parasite seems cosmopolitan, and is troublesome wherever poultry are kept. His great confrere, *Argas persicus*, is found only under certain climatic conditions and surroundings. Like *Argas*, *Dermanyssus* can undergo the most protracted fasts, and is at all times ready for a feast. They breed with extraordinary rapidity, and in a small space there may be congregated thousands in all stages, from minute eggs onwards through the almost transparent larvæ, then the nymphæ, and on to the adults. Surrounding them is a mass of greyish powdery material consisting of general detritus, such as moulted chitin, excreta, and dust. Although not yet proved to be carriers of harmful organisms, such as is the case with the ticks, their general habits should render suspicion justifiable. But there is, of course, the liability to secondary invasions of other ecto parasites, such as microscopic fungi. Poultry pluckers absolutely abhor them, and those who come in contact with them through handling infested poultry at night are to be commiserated The extraordinary numbers in which they congregate and their rapacity as bloodsuckers soon lead to an anæmic condition among infested poultry. It is usual to look upon the effects of these depredations as due to loss of blood.

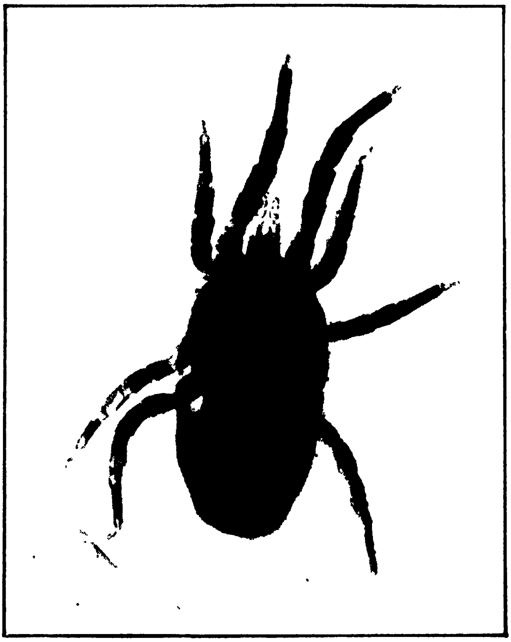


PLATE VII.

Their swarming hordes, however, produce a state of irritation that soon reacts upon the hardiest fowl. Of course, it can be understood that the physical effects of their mere presence on the body of the fowl, added to that of their numerous punctures, will seriously affect metabolism. Further investigations will probably, at the hands of the chemist, show that these disturbances are due to chemical changes and doubtless to specific poisons.

Remedial Agents.

When thorough measures are adopted I have never known any trouble in eradicating red mites from a poultry-house. Numerous insecticides will kill them at once, and like the tick, they succumb to the cheap and odorous kerosene. Sitting hens require periodic examination, for, although these pests are said to be noctambulatory, they will infest a sitting hen in the daytime; and in this respect I have seen gruesome sights of dying, neglected, sitting hens absolutely swarming with thousands of the pest. The use of wooden boxes, such as grocery boxes, &c., as nests is to be deprecated, for, if infested, they will need saturating with kerosene emulsion or some other insecticide. Brooders, and even incubators, have been known to be infested; the first intimation was the sickly appearance of the chickens, some of which were swarming with this rapidly-breeding parasite.

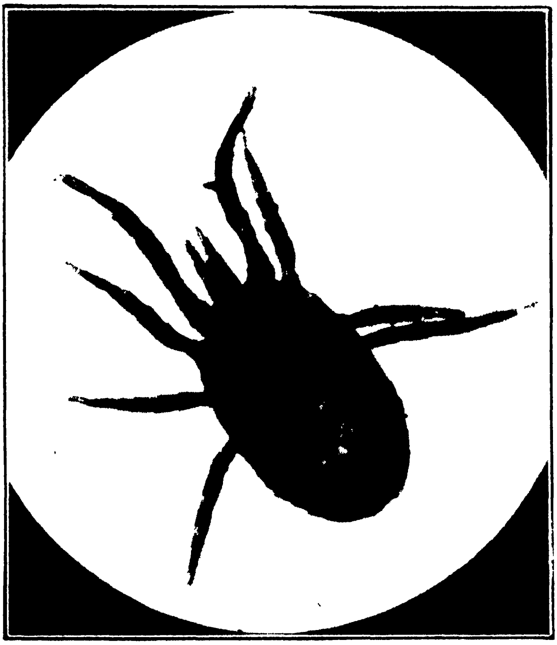


Plate VIII.

Plate IX.

Among poultry breeders many curious theories are current, due, as a rule, to inaccurate observation. The unfed adult *Dermanyssus* is a minute organism. In the early larval and nymphal forms they are invisible, except to persons of very keen eyesight. Eggs transferred from a nest and placed in an incubator would account for the machine becoming infested, as there might be several of the parasites on the eggs and yet escape notice. As with the poultry tick, *Argas persicus*, the adult *Dermanyssus* commonly carries larvæ firmly attached to its body. Frequently, on transferring a live adult to a watch glass of alcohol, it has been found, on examination under a moderately low power, to have one or more larvæ attached. The eggs are very minute, and are ellipse-shaped. The tarsi (end of legs) terminate in a peculiar caruneulation, which is furnished with hooklets, so that the parasite can attach itself to feathers, skin, &c., by the hooks, and adhere to smooth surfaces by aid of the carunculated pads. The stylet, peculiar to the female only, and forming portion of the rostrum (beak, or sucking organ), is a very fine and delicate organ, and practically does not admit of photographic reproduction ; it appears faintly in Plate VI.

PLATE X.

WARNING TO FARMERS.

It is a common practice on farms to allow poultry to roost in sheds where cattle and horses are fed, &c. Neumann quotes many cases of cutaneous affections in cattle and horses, and also a case where the inner ear of a cow was found, on *post-mortem*, to be invaded by *Dermanyssus*, which had tunnelled through, and were the indirect cause of death. Very probably many unaccountable deaths among stock may be due to the same pest. On all farms, as well as in poultry-yards, vigorous measures should periodically be taken to eradicate this and other parasites. For such purpose various sheep dips and disinfecting fluids are of service. Where the sheds are of timber, roofed with straw, the use of kerosene, and even kerosene emulsion, will certainly add to danger from fire. Formalin used as a 10 per cent. solution is very effective, and as it is cheap, can be freely used. Many cases are on record of infested dwelling-houses, &c., in such cases formalin is well suited. Bird cages, nest boxes, &c., should be immersed in a tubful of the mixture and allowed to soak for some hours, so that all cracks may be saturated.

Plate XI.

Unless this be carefully carried out the fluid does not penetrate to the hiding-places of the parasite. Superficial spraying and cursory applications of any germicide are so much energy misapplied, hence the reported difficulty in eradicating. Many people seem content to resort to occasional applications of insect powders, or use patent nest eggs containing carbolised powders, etc. The only rational method is to eradicate all pests, invade their strongholds and resorts, and adopt thorough measures. Remember, these parasites are carried from place to place, either as eggs, larvæ, nymphæ, or adults. The carriers may be poultry and birds, or they may come in crates, coops, bags, &c. There is no such thing as spontaneous generation, as seems a too common belief. It is always a good plan to dip the fowls, choosing a warm day. If then, at the same time, the houses are thoroughly treated, there should be no difficulty in the way of complete eradication.

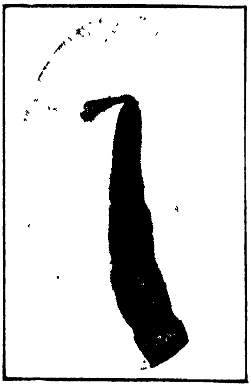


Plate XII.

PLATES.

Dermanyssus gallinæ (Dugès).

Plate	I.	Adult and recently hatched larva	x 100
Plate	II.	Group of parasites	x 30
Plate	III.	One large and one medium sized	x 56
Plate	IV.	Small one	x 66
Plate	V.	Nympha	x 97
Plate	VI.	Small female (the delicate stylet on rostrum is shown)	x 91
Plate	VII.	Adult male. Dorsal	x 61
Plate	VIII.	Ovigerous female. Dorsal	x 54
Plate	IX.	Recently-hatched larva—Shows undigested yolk in digestive caeca	x 110
Plate	X.	Female. Rostrum, Palpi, &c.	x 285
Plate	XI.	Male. Rostrum, Palpi, &c.	x 460
Plate	XII.	Leg, Tarsi, trilobate caruncle.	

(Original preparations mounted and photographed by the Author.)

FORESTRY IN AUSTRALIA.

SOUTH AUSTRALIA.

By H. HUGH CORBIN, B.Sc. (Lond.), B.Sc. (Edin.), Department of Woods and Forests, South Australia.

(Continued from page 40.)

IMPORTATIONS OF TIMBER.

The following indicates the more or less steady increase of imported timbers, and it is obviously coming chiefly from the following countries :— New Zealand, Norway, Sweden, United States. Further, since South Australia is only one of the large number of importing courtries, what must the total exports from these countries individually be ? Probably much more than they can conservatively afford. The total " cut " within each is much greater. Further, the bulk of the imports is coniferous timber, and, as before stated, although South Australia cannot grow these identical timbers it can develop timbers which will satisfactorily take the place of a great deal of the importations. This will not, of course, strike the timber merchant very favorably. He may never have had much to do with timber outside buying and selling and converting it.

Speaking quite generally, timber buyers will only view with favor large quantities of clean, well-grown timber and of a kind that is already known to the trade ; hence it is not surprising that the small quantity of South Australian timber, which has become unsound through neglect, is not appreciated. There is, however, not the least doubt that South Australia is capable, from the point of view of soil and climate, of producing adequate quantities and suitable varieties of timber for most purposes. The great trouble, however, is that before commercial quantities of good timber can be obtained from plantations at least 20 years must elapse : more extensive plantation and natural regeneration areas will be necessary to cope with the demand even if it has not increased by then.

VALUE OF TIMBER IMPORTED INTO SOUTH AUSTRALIA, AS DECLARED AT H.M. CUSTOMS, PORT ADELAIDE.

1905, £194,546; 1906, £240,637; 1907, £323,263; 1908, £543,784; 1909, £395,315; 1910,*£301,971; 1911, *£386,707—total, £2,386,224.

FACTORIES WORKING IN WOOD IN SOUTH AUSTRALIA IN 1910.

In 1910 there were 98 establishments working in wood and 1,716 hands employed. There were four basket and wicker work factories working and 62 hands. There were four brush factories working and 63 hands.

Timber sawn in South Australia in 1910:—Sawmills (town), 43,960,000 super. ft. valued at £510,663; sawmills (forest), 1,338,212 super ft. valued at £9,652.

FIREWOOD.

It is impossible to ascertain the quantity of firewood used in the State yearly. Probably a small fraction only of the total consumed is conveyed over the railways. The quantity of firewood conveyed over the South Australian railways for the 12 months ending June 31st was—1910, 171,467 tons; 1911, 116,709 tons; 1912, 125,684 tons. Could not landholders in certain localities profitably combine the production of firewood and fence posts on some of their holdings?

TIMBER USED IN MINING IN SOUTH AUSTRALIA.

In South Australia alone there are at least 15 mines utilising large quantities of timber as pit props, &c. The following indicates in money value the quantity:—The Broken Hill Proprietary Company, Limited, has expended during the last 10 years £211,000 on timber, which averages about £21,000 per annum. These figures appear in the reports and statement of accounts of the mine issued half-yearly. Most of this timber is imported Oregon, and is not Australian bush timber. It seems that sufficient bush timber cannot be conveniently obtained.

The quantity of South Australian bush timber used in the Wallaroo and Moonta Mines and Smelting Works during the last 10 years was—1903, £6,249; 1904, £7,016; 1905, £6,553; 1906, £8,989; 1907, £10,810; 1908, £8,220; 1909, £8,077; 1910, £8,160; 1911, £11,362; 1912, £12,356—total, £87,792. This statement was kindly furnished by Mr. F. C. Ward, Department of Mines. Mr. Ward estimates that probably £20,000 has been spent yearly on the same class of timber in other mines in South Australia.

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*Oversea imports only, inter-State trade not included.

SLEEPERS.

Sleeper timber in this State is rapidly decreasing. Among railway engineers in all parts of the world the concensus of opinion seems to be in favor of the use of wooden sleepers for railways, except in a few specially bad localities, where there is some specially active wood-destroying agent, *e.g.*, white ants, and even in these places much may be done by treating the sleepers before putting them down. There is no doubt that in ordinary localities, especially where wood is available, wooden sleepers are cheapest and most satisfactory if the more durable species or those which have been treated are selected carefully. The average price for red gum (*E. rostrata*) sleeper is, broad gauge, 4s. 11d.; narrow gauge, 2s. 8½d.

Number of sleepers used in South Australian railways, 1904-1912—Wooden, 2,298,294, costing £436,563 4s. 7d.; annual average 255,366 = £48,507 0s. 6d. In addition, number of metal sleepers used 1910-11—335,861, costing £111,556.

Until 1908-9 red gum sleepers were used, and after that time both jarrah and red gum sleepers were used. In other words, jarrah sleepers had to be imported, as it was no longer possible to find enough locally sawn red gum sleepers.

WOOD-PAVING IN ADELAIDE.

The number of jarrah blocks used in Adelaide up to December, 1912, is 1,595,800, at a cost of 10 guineas a thousand—£16,755. The proposed paving of North Terrace from King William Street to Blyth Street will take 285,000 wood blocks, and these will cost £2,992 approximately.

WATTLE-BARK.

It is also seen that Australia does not produce bark in sufficient quantities for exportation and its own consumption in certain years. Further, Natal and the other South African States are growing the Australian wattle, with black labor, on open veldt, which does not need any clearing. Annually increasing quantities of wattle-bark are put on the market at cheaper rates than Australia is apparently able to do. This trade is slipping out of Australia's grasp.

Further, Australia imports leather in many shapes and forms, while it certainly has the means to supply its own demand, and also to export bark and hides.

Of course, scarcity of labor and the high cost of labor is undoubtedly the reason why these industries cannot compete with similar ones of other nations. **It is, however, interesting and instructive to note that in 1908 1,935 tons and in 1909 1,401 tons of wattle-bark were imported from South Africa into Australia.**

Value of Wattle-Bark Exported Yearly from South Australia.

Year.	Value in £.	Year.	Value in £.	Year.	Value in £·
1840	—	1864	5,900	1888	41,299
1841	—	1865	13,853	1889	42,967
1842	180	1866	19,109	1890	56,006
1843	442	1867	18,294	1891	39,274
1844	3,310	1868	11,547	1892	34,131
1845	883	1869	19,299	1893	28,718
1846	1,900	1870	22,497	1894	40,333
1847	—	1871	21,393	1895	48,781
1848	—	1872	33,747	1896	51,682
1849	50	1873	20,268	1897	39,665
1850	193	1874	14,552	1898	62,132
1851	155	1875	26,007	1899	69,985
1852	709	1876	54,104	1900	63,732
1853	330	1877	31,382	1901	67,601
1854	845	1878	54,379	1902	68,850
1855	1,345	1879	25,666	1903	65,062
1856	2,345	1880	42,828	1904	59,902
1857	3,162	1881	38,070	1905	54,475
1858	2,542	1882	40,131	1906	59,996
1859	3,698	1883	48,576	1907	57,248
1860	5,815	1884	45,049	1908	47,143
1861	2,268	1885	43,825	1909	54,432
1862	2,866	1886	51,176	1910	*15,208
1863	5,969	1887	56,987		

*These figures only represent oversea exports, since no inter-State transfer is recorded after 1909.

Buying Price of Wattle-Bark.—1903-4, £6 15s. ; 1910, £6 ; 1911, £6 10s. ; 1912, £7 ; average, £6 11s. per ton approximately.

Value of Wattle-Bark Imported into and Exported from the Commonwealth, 1901-1910.

	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
	£	£	£	£	£	£	£	£	£	£
Imports	616	128	186	340	632	58	156	16,289	12,774	5,461
Exports	48,514	54,607	61,013	93,927	189,699	162,453	132,342	102,410	91,945	119,254

Production of Wattle-Bark in South Australia.

Year.	Tons.	Year.	Tons.	Year.	Tons.
1901–2	8,566	1905–6	8,506	1909–10	5,346
1902–3	9,212	1906–7	7,274	1910–11	6,598
1903–4	8,173	1907–8	7,787		
1904–5	7,343	1908–9	6,889	Total	73,694

Average annual production = 7,300 tons. The average price per ton of wattle-bark for the years 1901-10 is £6 11s.; therefore the total value of bark produced for 10 years = £482,674. **Average value of bark produced per annum = £48,267.** This bark is produced haphazard, and therefore the amount varies from year to year. Given suitable labor conditions there seems no reason why much more should not be grown, especially seeing that enormous numbers of raw hides are exported untanned and much land is entirely suitable for the purpose of growing the tanning bark.

Wattle-Bark Imported into South Australia.

From Whence.	Year.	Quantity.	Value.
		Cwts.	£
Western Australia and Victoria	1905	31,962	11,927
Western Australia	1906	5,780	2,342
"	1907	nil	nil
Western Australia and Victoria	1908	1,119	471
Natal	1909	565	221

*Wattle-Bark Exported from Natal.**

Year.	Quantity.	Value in £	Year.	Quantity.	Value in £
1886	39 packages	11	1895.....	57,666 packages	17,209
1887	449 "	315	1896.....	3,378 tons	16.450
1888	864 "	410	1897.....	4,098 "	17,659
1889	4,623 "	2,713	1898.....	9,427 "	30,929
1890	7,911 "	3,389	1899.....	11,070 "	57,885
1891	13,972 "	5,588	1900.....	8,900 "	46,479
1892	19,408 "	9,234	1901.....	13,771 "	69,850
1893	22,976 "	9,304	1902.....	15,537 "	74,554
1894	40,485 "	12,569	1903.....	12,135 "	70.581

Some years ago wattle seed was sent from Australia to South Africa, with the result that Natal has been a successful grower and exporter of tanning bark, and the above figures indicate the development of the industry. Of course, the climate is good for wattles and the labor is cheap, being mostly black labor.

Wattle-Bark Exported from British South Africa.

1906.	1907.	1908.	1909.	1910.
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
34,999,406	54,478,492	55,661,949	80,127,399	92,610,026
£	£	£	£	£
91,856	139,397	134,563	194,699	219,433

This indicates a high rate of increase, which seems practically steady. There is no doubt that South Africa is gaining what the Commonwealth is losing in this industry.

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* These figures are copied from J. H. Maiden's publication on Wattles.

CO-OPERATIVE PURCHASE OF BULLS.*

A DENMARK DEVELOPMENT.

Associations for the co-operative purchase and use of bulls in Denmark date from 1874, in which year the first cattle-breeders' association was formed in Jutland. A second association was formed in 1881, but the increase in the number was slow until 1887, after which rapid progress took place in all parts of the country. There are now more than 1,300 associations of cattle breeders in Denmark, with over 1,500 really good bulls.

It should be explained at the outset that the work of the associations is not solely for the purpose of obtaining, at a low cost to the members, the use of a good bull, but is also directed to improving the quality of the herds, and as such has been fostered by the Government, many of the schemes of the latter for the improvement of the livestock industry of the country having been built on the work of the associations.

The associations are local, and their membership varies from four to 60, the average being about 24. One or more bulls of recognised breeding may be purchased, the purchase being usually made with borrowed money, which is paid off after a period of four years, this time being the bull's average period of utility. As the members of the association generally own more cows than their bull or bulls can serve, a local judging committee is appointed, which, together with an expert employed by the "joint management" of several associations in common, visits each member and selects a number of cows worthy to be bred to the association bulls, in proportion to the size of his herd and the total number of cows in the association.

The bull is, as a rule, stationed with the member who submits the lowest bid for keeping him, the price varying from about £10 to £19 per annum.

Assuming that the bull costs £56 (an average price), that its serving capacity is four years, that its sale value is £24, that the members of the association own 80 cows with a service fee of 4s. 3d., and that the bull is awarded a prize at each of the yearly shows, a typical balance-sheet of an association would be as follows :—

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* From a report by His Majesty's Chargé d'Affaires at Copenhagen, and *United States Bureau of Animal Industry*, Bull. 129. Reprinted from *Journal of Board of Agriculture*.

Income.	£	s.	d.
State subsidy	5	10	0
Proportion of sale value	6	0	0
Prize at annual cattle show	3	10	0
Service fees from 80 cows at 4s. 3d.	17	0	0
	£32	0	0

Expenditure.	£	s	d.
Yearly instalment on purchase price	14	0	0
Interest	1	0	0
Fodder and keep (average)	13	5	0
Veterinary surgeon's fee	0	10	0
Insurance	1	5	0
Show expenses	1	5	0
Contribution to the "joint management"	0	15	0
	£32	0	0

The insurance mentioned in this statement is usually made with a special co-operative insurance company, and protects the association from losses which might be incurred by accident, sickness, or death of the bull. As regards the yearly instalment of the purchase price, the individual members are responsible for the payment of this in proportion to the number of cows each has registered in the association. The effect of the association being started with borrowed money is that it is possible for farmers with small means to participate.

The State subsidy (averaged above as £5 10s.) may amount to as much as £8 per annum for each bull. The grant is given on condition that the bull is examined by a veterinary surgeon twice every year ; that the best cows of the members are selected by the committee to be served by the bull ; and that the committee at least once a year inspects all the herd in the association in relation to their health. Further, the bull must have received a premium or " recognition money " at a Government show, or at a breeding association show supported by the Government. It should be explained that a large amount of money is set aside by the Government for premiums at shows. The " recognition money " is money distributed in respect of bulls which do not receive premiums, but which are considered worthy of recognition as good bulls. A bull to be eligible for Government aid must, furthermore, win a premium every year at a breeding association show until such time as his offspring receive premiums, or, after having reached the age of three years, he must at least be found worthy of a premium at a Government show. No aid is granted before the bull reaches the age of 1½ years, and then only as long as he is in possession of his full breeding capacity. In case a bull is sold, the Government aid can be retained if the association, within two months after the sale, buys another bull meeting the above-named requirements. A complete report from the association is required by the Government at the end of each year.

The extent to which this Government aid benefits the associations will be evident from the typical association balance-sheet quoted above. In the absence of the State subsidy and the show premium, the service fee would have to be raised to over 6s. per cow. It must not be thought, however, that all the associations receive Government aid. There were, in 1906, 30 co-operative breeding associations which did not receive Government aid, and were consequently not subjected to Government supervision. Additional aid may be obtained by the association both for special work in developing good families and for keeping records of the yield of milk and butter-fat and the food consumed by individual cows in the herd.

The following extracts from by-laws of cattle-breeders' associations under common management on the Island of Funen may be given as typical of the rules under which these associations work :—

" The aim of the cattle-breeders' association is to produce the sure and rapid development of a sound, well-built, productive Red Danish breed of milch cows. The aim shall be reached principally by the purchase of meritorious herd bulls, by selecting the best dams (the selection being, as much as possible, based on information about yielding capacity and pedigree), by a rational treatment of the offspring, and by the holding of local shows.

" Every cattle breeder within the district is eligible to membership who subscribes to these by-laws and has in his herd at least one cow which is considered by the management of the association to be worthy of joining the ranks of the breeding animals.

" The management of the association shall be vested in a board of directors. . . . The board shall direct, purchase, offer for service, exclude, and sell the herd bulls of the association, select the cows of the members, act as judges at the local shows, and give members advice regarding their book-keeping. . . . The board of directors or a committee of the members shall, once a year, inspect the herds of the members on their farms.

" The herd bull must be sound and well-built, of Red Danish milking breed, and recognised good pedigree. He shall be insured, and twice a year shall be examined by a veterinary surgeon. He should not be utilised for breeding purposes until he reaches the age of 1¾ years. When purchasing bulls, the association should secure guarantee of breeding capacity. The bull shall be exhibited every year until he shall have received premiums on account of his offspring. Until the age of 3 years he shall be exhibited at a breeding association show subsidised by the Government; and after the age of 3 years at the Government show. He shall also be exhibited at the local shows.

" The members are entitled to have their cows served by the association bull, provided that the cows are not subject to abortion, are otherwise healthy, and are approved by the board of directors.

"The fee for service shall be determined every year by the board of directors, and shall be paid by the members in proportion to the number of their eligible cows.

"Every member must keep the records directed by the board of directors, and is bound to exhibit, at the local shows arranged by the board of directors, all selected cows and their offspring by the association bull until the heifer becomes pregnant for the first time and the bulls reach the age of 2 years. Calves less than 3 months old need not be exhibited. Each calf shall be earmarked with the number of its dam, according to a method adopted by the management.

"The members shall be bound, on the demand of the board of directors, to exhibit the offspring of the association bull, if such are in existence, at the annual offspring shows preceding the Government shows.

"The cows shall be selected and a record kept in the selection book. Only healthy animals shall be admitted."

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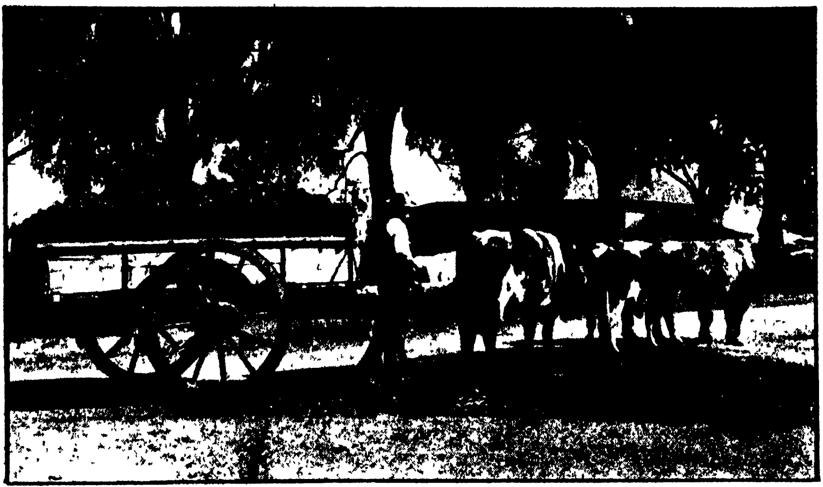

Carting Grapes.

POULTRY NOTES.

By D. F. **Laurie**, Government Poultry Expert and Lecturer.

OPERATIONS FOR SEPTEMBER.

Hatching should be in full swing In the earlier northern districts the end of September or the first week in October is late enough for chickens, except a few required for special purposes. Ducklings may still be hatched, and if well fed will be in time for the Christmas trade. Goose and turkey eggs may also be set. Carefully select the eggs required for hatching. Firstly, do not set any eggs unless you know that they are laid by hens of special merit. Do not use pullets' eggs for hatching—the results will be poor. If you wish to breed layers, obtain eggs laid by hens of tested laying strains. If you are breeding for table you should select eggs from standard specimens of the following breeds:—Orpingtons, Faverolles, Plymouth Rocks, Wyandottes, Langshans, Dorkings. Or the following crosses may be resorted to for the production of good table birds:—Indian or Old English Game cock and hens of Orpington, Rock, Wyandotte, Faverolles, &c. There are other crossbreds, but these include the best and most easily obtained.

Rearing the Young Stock.

Outside brooders with ample range provide the best conditions. At Parafield there is a sample brooder, which is giving excellent results. Forty or 50 chickens are placed in it and confined for a few days. They are then given full liberty and roam all over the place, often straying 150yds. from the brooder, but are always able to find their way back again at night. Where a good run is not available supply plenty of scratching litter for the birds to exercise themselves in. Plenty of green food, both chaffed and long, must be provided, also grit of all sorts, and a good variety of food, including some animal food. Keep the chickens hard at work scratching and feeding, and you will be delighted with their growth. Fork over some ground for the chickens to scratch in—they enjoy the occupation, and find worms, insects, &c.

Vermin.—Keep a sharp look-out for vermin of all kinds, and eradicate them without fail. Chickens reared by hens are generally infested, and if neglected may die. Kerosine, sheep-dips, coal-tar mixtures, &c., are all good for use on the houses, coops, &c. For infested chickens apply a liberal dressing of some good insect powder.

Separate the Sexes.—This should be done early in the case of the light breeds, such as Leghorns. The little cockerels can soon be distinguished, and when six to eight weeks old are far better in a yard by themselves. The pullets thrive better when yarded separately. Leghorn cockerels about 12 to 14 weeks old, and weighing 3lbs. upwards, will sell at fair prices until Christmas. Select those which are to be kept as breeders, and fatten the rest and market them as soon as fit. It does not pay to hold on to any table poultry after they are fit for market.

MARKET EGGS.

Eggs should be collected once daily, although twice is better in hot weather. All eggs for market should be infertile. The infertile egg keeps indefinitely, and is therefore worth more to the trader, although he is slow to recognise the fact. Any dirty-shelled eggs should be washed in clean water and then dried with a clean cloth. Stains may be removed by rubbing with salt. Do not market any very small eggs, or those with rough shells. Take some pride in the quality of your produce.

Patent Egg Crates.—In answer to numerous inquiries and for general information, it may be stated that egg cases, to hold 25doz. eggs, complete with fillers and wood-wool pads can be obtained from the Manager of the Produce Department, Adelaide, price 2s. 6d.

MARKETING BIRDS.

Many of the crates in which poultry are forwarded to market are a disgrace to the consignors. Allow plenty of head room for fowls and ducks. The crates should be at least 18in. high. Provide a good supply of fresh water in suitable vessels. Allow a fair amount of space, but not too much, otherwise the birds get knocked about in transit. Use decent crates, and have them returned. Put your name and address upon the crates, and address them clearly, giving the number of birds you are forwarding. Always send a postcard to the person to whom you are sending the birds, so that he is duly advised when to expect them, and the number also. Grade your birds. Do not mix old and young, fat and skinny together. If you do the price will be based upon the worst specimen. See that your birds are healthy, and free from tick and other vermin. Should diseased or tick-infested birds be discovered in a market they will be seized and destroyed, and the sender is liable to prosecution.

Good Prices are now being obtained in the Adelaide markets for table poultry of good quality. This is always a period of scarcity, and therefore of good prices. Breed in March and April and you will have a big supply ready for such good markets. Eggs have realised good prices all through, and it is to be hoped that the good market will be maintained.

All-Round and Heavy Breeds.

The committee of the recently-formed General Purpose Poultry Society is busy organising a most comprehensive scheme, as outlined by me, and handed to representative breeders to act upon. The main objects of the society are to promote the breeding of the all-round, or general purpose breeds, and to organise a series of tests to show their respective values. When the scheme is matured I will discuss it at length. All breeders should support the movement, as it is in their interests. The secretary is Mr. A. J. Todd, c/o Messrs. J. Hains & Co., Port Adelaide. The breeds concerned include all varieties of Orpingtons, Wyandottes, Plymouth Rocks, Dorkings, Old English and Indian Games, Malays, Langshans, Faverolles, Rhode Island Reds, Sussex, &c. These breeds generally include good laying strains —*i.e.*, the general average production of eggs is sufficiently profitable when the superior value of the breed for table poultry production is taken into account. The objects of the club are, of course, limited to pure breeds. It costs no more to breed pure stock than it does to breed crossbreds, and there is this advantage—there is generally a good demand for pure stock. Therefore the best can be reserved for sale as stud or show stock, and the others can be fattened and sold as prime table birds. It is well known that the above breeds have given excellent results. It is generally the personal factor which makes for success. The club will not encourage those strains which have been bred purely for egg production at the expense of type, flesh, &c. For egg production alone you select another breed, as stated.

To Prospective Breeders.

A number of people who intend embarking in poultry-breeding on a more or less extended scale have recently consulted me on the subject. It is now too late in the year to begin breeding. It is, however, the right time to decide upon an early start next autumn, and the intervening time may be well occupied in deciding upon a suitable locality, and in erecting the necessary plant. Stock birds should be obtained in January or February, and accustomed to new conditions, so that they are laying in March. It takes considerable time to arrange all the details of even a small plant. Larger concerns cost a considerable sum of money in labor and material. Many people leave matters until the last moment, when an attempt to rush matters ends in failure. I hope to issue shortly an illustrated bulletin on poultry-housing and yard-construction. The standards advised by me have proved their excellence, and are becoming universally adopted. The adoption of standards simplifies the work of laying out and construction.

Suitable breeding stock must also be arranged for some time before it can be obtained. It is courting failure to do as some do, viz., buy anything with feathers upon its back. None but carefully-selected stock will prove a profitable foundation for a successful poultry farm.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, to terminate March 31st, 1914.]

Competitor.	Eggs Laid for Month ended August 31st.	Total Eggs Laid from April 1st, 1913, to August 31st, 1913.
SECTION I.—LIGHT BREEDS		
WHITE LEGHORNS.		
Hurford, E. W., Grangeville	130	503
Hammill, H., Kogarah, New South Wales	138	490
Carter, A. A., Keswick	105	300
Robins, G. W., Hawthorn, Victoria	128	503
Dunn, L. F., Keswick	122	449
McKenzie, H., Northcote, Victoria	117	543
Cowan Bros., Burwood, New South Wales	138	460
Robbins, G. W., Hawthorn, Victoria	120	435
Pettigrove, T. A., Northcote, Victoria	127	484
Eckermann, W. P., Eudunda	112	308
Robertson, F., New Hindmarsh	84	299
Pettigrove, T. A., Northcote, Victoria	134	521
Cant, E. V., Medindie	114	393
Schafer, N. H., Strathalbyn	124	487
Redfern Poultry Farm, Caulfield, Victoria	110	438
Chapman, G. H., Port Pirie	97	289
Lewis, F. M., Caulfield, Victoria	104	369
Redfern Poultry Farm, Caulfield, Victoria	137	521
Hagel, W. C., Mallala	129	432
Hocking, E. D., Kadina	81	311
Sargenfri Poultry Yards, East Payneham	114	396
Joass, W. A., Rothbury, New South Wales	124	427
Bennett & Furze, Wright Street, Adelaide	140	430
Jury, W. H., Torrensville	120	454
Olive Poultry Farm, Freeling	120	418
Kelly, Mrs. W. J. L., Quorn	79	199
Indra Poultry Farm, Freeling	159	578
Electricum Poultry Yards, Glenelg	123	438
Sargenfri Poultry Yards, East Payneham	130	496
Moritz Bros., Kalangadoo	130	507
Brown, S., Gembrook South, Victoria	124	502
Matthews, H. G., Fullerton	140	466
Harris J. G., Black Forest	133	487
Tockington Park Poultry Farm, Grange	140	479
Bradley, J. E., Newport, Victoria	143	568
Miller, B., Parkside	125	342
McKenzie, E., Northcote, Victoria	141	585
Tockington Park Poultry Farm, Grange	132	487
Provis, W., & Son, Tumby Bay	132	468
Hillcrest Poultry Farm, Brighton, Victoria	125	499

EGG-LAYING COMPETITION—*Continued.*

SECTION I.—LIGHT BREEDS—*Continued.*

WHITE LEGHORNS—*Continued.*

Competitor.	Eggs Laid for Month ended August 31st.	Total Eggs Laid from April 1st, 1913, to August 31st, 1913.
Beadnall Bros., Gawler	114	334
Morgan & Watson, Frankston, Victoria	143	564
Gibbs & Pine, Queenstown	86	262
Hillside Poultry Yards, Hamley Bridge	102	341
Hall, A. W., South Oakleigh, Victoria	119	394
Dreyer, G. H., Wolfram Street, Broken Hill	127	478
South Yan Yean Poultry Farm, Doreen, Victoria	146	426
Pope, R. W., Heidelberg, Victoria	154	545
Tabuteau, J. O., Black Rock, Melbourne	87	443
"Koonoowarra," Enfield	115	377
Hagger, J. C., Orroroo	139	467
Bertelsmeier, C. B., Clare	113	429
South Yan Yean Poultry Farm, Doreen, Victoria	125	427
Jelliff, Mrs. T., Beverley, Adelaide	141	498
Hughes, J. J., Elsternwick, Victoria	137	346
Stewart, J. R., Thirlmere, New South Wales	107	364
Aveling, T. B., Quorn	75	257
"Nunkerowi," Neales Flat	90	276
Prior, D., Moonta Mines	114	339
Leonard, W. J., Port Pirie	118	344
Barkla, L. W., Gawler South	118	362
Foreman, E., Hindmarsh	129	350
Broderick Bros., Gawler	118	296
Tubb, E. C., Frewville	113	308
Harfield, B. L., Pinnaroo	105	309
Foreman, E., Hindmarsh	122	336
Tomlinson, W., Westbourne Park	113	420
Woodhead, H., Torrensville	122	477
Padman, A. H., Hyde Park	130	422
Franklin, G., Norwood	150	501
Mathias & Weller, Unley	134	306
Messenger, A., Port Adelaide	138	439
Albion Poultry Farm, Magill	127	475
Dunstan, L. A., Port Pirie	121	346
Trenwith, T. H., Kadina	115	272
Purvis, W., Glanville	144	451
Rice, J. E., Cottonville	120	417
Evans, H. A., Richmond	128	353
Miels, C. & H., Littlehampton	115	448
Swift, W. G., Northcote, Victoria	144	481
Bertelsmeier, C. B., Clare	135	475
Brundrett, S., Moonee Ponds	129	350
Glenelg River Poultry Farm, Mount Gambier	131	418
Padman, A. H., Hyde Park	105	369
Purvis, Miss Gracie, Glanville	129	368
Braund, J. E. & H. J., Islington	113	365
Ontario Poultry Farm, Clarendon	99	279
Brock, A. G., Hamley Bridge	133	280
Russell, E. L., Salisbury	144	374
Schwabl, J., Elsternwick, Victoria	132	412
Moritz Bros, Kalangadoo	134	453

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended August 31st.	Total Eggs Laid from April 1st, 1913, to August 31st, 1913.
SECTION I.—LIGHT BREEDS—*Continued.*		
WHITE LEGHORNS—*Continued.*		
Craig Bros., Hackney	126	354
Codling, H., Mitcham Park	92	292
Tidswell, H. J., Clarence Park	103	251
Bennett, E. V, Kalangadoo	126	401
Lillywhite, R. G., Malvern	116	326
Harris, A. W., Mallala	127	416
Hagger, W. H., Malvern	142	510
Winter, W. C., (Nalpa), Strathalbyn	94	268
Whitegate Poultry Farm, Deepdene, Victoria	129	343
BROWN LEGHORN.		
Toe, C. E., Brighton, Victoria	81	123
BLACK MINORCA.		
Whitrow, A. J., Knoxville	125	309
SECTION II.—HEAVY BREEDS.		
BLACK ORPINGTONS.		
Neville, A. B., Fullarton	132	376
Thornton, W. J., Kew, Victoria	148	370
Kenway, D., West Pennant Hills, New South Wales	146	533
Martin, B. P., Unley Park	139	423
Cowan Bros., Burwood, New South Wales	117	296
Tockington Park Poultry Farm, Grange	126	321
Pearson, W. S., Kingswood	109	304
Hall, A W, South Oakleigh, Victoria	126	340
Padman, J. E., Plympton	108	359
Greaves, W. E., Prospect	49	182
Bertelsmeier, C. B., Clare	68	192
Coto, T. W., Myrtle Bank, Victoria	133	419
Convent of the Good Shepherd, Oakleigh, Victoria	124	298
BUFF ORPINGTONS.		
Hocart, F. W., Clarence Park	110	316
SILVER WYANDOTTES.		
Dunn, L. F., Keswick	103	429
Western, F. C., Marion	76	271
Kappler Bros., Marion	114	302
WHITE WYANDOTTES.		
Bradley, J. E., Newport, Victoria	134	384
BLACK LANGSHANS.		
Stevens, E. F., Littlehampton	109	330
FAVEROLLES.		
Williams, W. H, Frewville	112	179
DORKINGS.		
Cathcart, J. F., Newburg, Scotland	101	189

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended August 31st.	Total Eggs Laid from April 1st, 1913, to August 31st, 1913.
SECTION III.—PRODUCERS.		
Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.		
WHITE LEGHORNS.		
Broster, G., Mallala	129	427
Carling, R., Kangaroo Flat	134	477
Rowe, J., Long Plain	112	407
Broster, G., Mallala	125	424
Gilbert, F. W., Kangaroo Flat	151	482
Campbell J. D., Barabba	134	434
Forest Leigh Poultry Farm, Jamestown	131	342
Kerr, R., Longwood	139	431
Carling, Mrs., R., Kangaroo Flat	132	469
Rowe, J., Long Plains	128	404
Gill, R., Marrabel	119	325
Wurst, G. H., Marrabel	140	356
Sherrah, E., Long Plain	122	364
Rowe, N., Long Plain	132	411
Shepherd, R. H., Balaklava	129	342
Lacey, F. C., Kybybolite	130	445
Bertelsmeier, O. O., Booborowie	105	415
Dunn, H. J., Black Springs	87	2[illegible]2
Drake, C., Naracoorte	109	342
Rackham, C. Naracoorte	137	478
Holmes, F. A., Naracoorte	106	352
Hutchison, W. J. S., Naracoorte	95	259
"Herdsfield," Mount Gambier	146	515
Smith, R. L., Hynam	110	286
Gill, Mrs. J., Kapunda	105	291
Sampson, C., Kooringa, Burra	135	443
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	128	230
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	114	378

D. F. LAURIE, Poultry Expert.

* * *

PARAFIELD EGG-LAYING COMPETITION.

MONTHLY REPORT.

Decreased Number of Competitors.

On the 31st of July the eggs laid by each pen were weighed. It was found that four pens were disqualified and were then returned to their owners. There are now only 151 pens, or 906 pullets, competing. The total number of eggs laid by these four pens until July 31st has been deducted from the grand total number of eggs laid.

Health.

All the birds are in good health and are looking very well. There have been no cases of sickness during the moth. As may be expected when dealing with over 900 birds in full lay a number of deaths occured. During the month 10 birds died. Two were found dead, evidently from apoplexy; four were the victims of cannibalism, which has been a trouble in one or two pens; two died from severe strain in laying; one died of rupture of oviduct and internal hæmorrhage; and one wasted away (tuberculosis).

Broodiness.

In Section 2 there were 17 cases during the month, as follows:—Six Black Orpingtons, three Buff Orpingtons, three Silver Wyandottes, two White Wyandottes, three Langshans. In Section 1 one White Leghorn went broody.

The Weather

During the month was generally fine and dry; mild temperatures were the rule. The rainfall for the month totalled 1·21in.

Visitors.

Thirty breeders and others visited the poultry station.

Egg Production.

During the month the daily totals have shown steady and satisfactory increase, and before long the production will reach its maximum. The average per pen of six pullets shows an increase of 30 eggs, compared with last year's test. This satisfactory return is from 151 pens, as against 134 pens last year. Nineteen pens have laid more eggs than were laid at the same date by the pen which the year before last made the famous record of 1,589 eggs.

THE YARDS

Are now in course of erection, and during September the birds will be gradually accumstomed to outside conditions. Each yard will be enclosed by a windbreak fence. The lower portion is of galvanized corrugated iron sunk a few inches in the ground. To this iron windbreak the wire netting is attached and fastened to the posts. Each yard is 9ft. by 40ft. and will be well sheltered. Oats, barley, and rye have been sown in the yards and will provide a little green picking. Later on the yards will be well supplied with straw scratching litter.

FEEDING.

The usual rations are maintained without alteration. A fair supply of green food is available, sufficient for all requirements. A considerable area of lucerne has been sown for future use; some thousands of kale plants have been set out; rye and barley are making fair growth, and other fodders will soon be sown, so that a constant supply, and in variety, will be available.

D. F. LAURIE, Poultry Expert and Lecturer.

EXTRACT FROM TRADE COMMISSIONER'S REPORT.

ROYAL AGRICULTURAL SOCIETY'S SHOW, BRISTOL.

The Royal Agricultural Society's Annual Show was opened at Bristol on the 2nd July, and remained open until Saturday, the 5th. The weather that obtained was everything that could be desired, and accordingly the attendance was almost a record one, the number registered on the Friday, being 78,000, and the average attendance for the five days about 50,000 per day.

On Friday, the 4th, the show was visited by His Majesty the King, who took a particular interest in the oversea section of the show.

As requested by the Premier (the Hon. A. H. Peake) when he visited Bristol, I endeavored to put up the very best show South Australia has ever had in the United Kingdom. Our marquee covered an area of 60ft. x 30ft. As it was quite impossible to have a scenic arrangement on the same lines as we have previously had it in the larger halls, I had to adopt a new system. In front of alternate bays we had rows of real flowers, different colors in each bay, thus giving a unique appearance to the whole show. The South Australian exhibit was a success, and proved to be the leading attraction of the section. The following is an extract taken from the *Western Daily Press* of July 5th. This paper is one of the most important outside London, hence my reason for quoting from it in particular:—"The wonders of South Australia, as evidenced in the overseas section, are attracting thousands of visitors daily, there being a continuous stream of interested folk doing the tour of the pavilion wherein the productions of the Central State of the Australian Commonwealth are displayed. In panoramic effect are seen the vineyards, cornfields, sheep farms, &c. Fruits—bottled, dried, and fresh; honey, tinned meats, and such well-known brands of Burgundy as Tintara, Harvest, Emu, Keystone, which are household names, constitute features of the exhibit, which are well known in our own district. The value of such an exhibit cannot be over-estimated as illustrating what the ideal climate and fertile soil of South Australia can produce for the Mother Country in the way of the necessaries and luxuries of life."

On each day there was a continual stream of people passing through the tent from 10 o'clock in the morning until closing time at night. As a medium for advertising South Australia and its products in a general way there is no doubt that this show has been a complete success; but, as I have on several previous occasions stated, I do not consider that agricultural shows, as a rule, are much use to us from a direct trade standpoint. Had I been in a position to do so I am sure I could have sold thousands of pots of honey and any other lines I had that the public could have taken away with them; but, unfortunately, the authorities will not allow selling at the shows.

Amongst the various articles that we exhibited were—Wine, tinned meats, honey, fresh fruit, dried fruit, tomato sauce, and eucalyptus oil.

The panels were executed in oils, and were admitted by the visitors from South Australia to be most realistic of South Australian industries.

In addition to the South Australian Government, the Commonwealth, Western Australia, and Queensland Governments were represented, also the Dominion of South Africa, the Dominion of Canada, the Federated States Settlement, and Bengal Government.

I may say that it was admitted, not only by the visitors, but by the press generally, that the South Australian, though not the largest, was undoubtedly the best arranged and most practical of the whole from a business standpoint.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, August 13th. There were present Mr. G. R. Laffer (Chairman), Professor Perkins, Col. Rowell, Messrs. T. H. Williams (Chief Inspector of Stock), C. J. Valentine, C. J. Tuckwell, C. E. Birks, J. Miller, F. Coleman, A. M. Dawkins, and G. G. Nicholls (Secretary).

Lambs and Sheep.—The following resolution from the Kadina Branch was tabled :—" That in the opinion of this Branch a letter should be forwarded to the Railways Commissioner asking him whether he is prepared to offer any special facilities for trucking lambs and sheep direct to the Port Adelaide works instead of sending them, as now, through the market." The Secretary was instructed to ascertain exactly what facilities were required.

Trade Through the Post.—The Longwood Branch forwarded the following resolution :—" That the Advisory Board be asked to approach the postal authorities with a view to the conveyance through the post, the delivery and the collection of payment for parcels of fruit, cut flowers, certain specified vegetables, and eggs in lots up to 12lbs. weight, and also approach the railway authorities with a view to the carriage of qauntities from 10lbs. upward, at minimum rates, and the advertising at the various railway stations of the names of persons who have fruit to sell." The Branch also desired the Board to " inquire into the facilities available on the lines indicated in our State, in New Zealand, and in England." The Secretary was directed to go into the matter.

Advisory Board Membership.—A resolution was received from the Cowell Conference that, in the opinion of the Conference, branches should have a voice in the election of members of the Advisory Board. It was decided to refer the resolution to the Minister.

Experimental Work.—A communication from the Butler Branch read—" That in the event of the Shannon Experiment Farm not being reopened, the Government be asked to supply each Bureau with seed and manure sufficient to enable one member to conduct experiment plots in each district." Mr. Coleman considered that such plots would serve equally as well as the farm. The Secretary, in reply to a question, said that two men on Eyre Peninsula were now preparing land for experimental work next year and that did not include the proposed operations along the Minnippa Hill railway. It was decided to acquaint the Branch with this fact, and to forward its request to the Director of Agriculture.

Changing a Name.—An application from the Hooper Branch to be permitted to change its name to Wynarka—the name of the railway station—was granted, *New Branches and Members.*—The Board approved of the formation of new Branches of the Bureau at Coonawarra and McNamara Bore, with the following gentlemen as members, viz.:—Coonawarra—Messrs. P. J. Lynch, J. Skinner, T. A. Webber, W. H. Lear, J. N. McBain, H. A. Reschke, E. F. McBain, W. Brown, F. Darwent, L. Stapleton, W. Burkett. McNamara Bore—Messrs. E. Bicknell, G. H. Perriam, W. Hockridge, R. V. Perriam, F. A. Beckmann, J. B. Williams, C. L. Bruce, F. C. Bennier, T. E. Bennier, L. Tonkin, M. V. Blackett, W. W. Paterson, J. D. Aitkin, H. M. Aitkin, F. G. Williams.

The following gentlemen were accepted as members of the Branches shown:—Yongala Vale—G. Keatley; Borrika—C. H. A. Tonkin, J. Wright; Mount Bryan East—E. S. Wilks, W. Campbell; Georgetown—J. Buchan, H. L. Saunders, E. B. Tucker, H. Tucker, W. Mackwood; Berri—J. Wack, V. Fowles; Hawker—W. A. Reid; Redhill—A. Dick; Salisbury—A. R. M. Basford, B. Rumball, F. J. Fleet; Shannon--R. Brown, P. Fitzgerald, H. Schmidt; Pine Forest—E. Hewett; Geranium—W. Morcom, F. Norton, sen., E. Nickols, W. G. Nickols, E. Winch; Millicent—J. B. Mitchell, T. W. Kealy; Blyth—F. Wiltshire, J. H. Pratt, A. D. Pedler; Pinnaroo—J. Pitkin; Hookina—H. Huddleston, F. Stone; Yabmana—F. W. Beinke; Northfield—A. Lowe, J. Eisele; Wirrabara—L. S. Cobiac, H. Francis, W. Rooke; Yongala Vale -J. I'Anson; Elbow Hill—P. C. Wheeler; Hooper—F. Yates, D. Murphy, C. W. Schultz, J. Schultz; Strathalbyn—W. H. Cumming, F. M. Michelmore; Lyndoch—A. Threadgold; Uraidla and Summertown—J. McAskill, F. H. Stacey, G. Collett; Watervale—J. L. Broadbent, F. J. Mutton, J. Ward, sen.; Lameroo—O. W. Davidson, E. F. Davidson, G. A. Martin; Morphett Vale—S. Pocock; Koppio—J. Liddy; Coonalpyn—J. J. Angel, D. T. Cronin; Davenport—G. Goldner; Willowie—A. Bull, A. G. Blight; Renmark—J. E. Smith; Pine Forest—I. Edwards; Paskeville--R. Petherick, A. Petherick; Yallunda—W. E. Rolland, W. Forrest, E. Walsh, W. Winstanley, R. B. Jenkins; Keith—A. V. Shannon, S. C. R. Hantke; Woodside—W. Rollbusch, A. J. McCarthy, H. Howell; Morchard—W. Keauschner; Meningie—L. D. Martin.

Life Membership.—The honor of life membership was conferred upon the following members of Branches:—Messrs. A. F. Noll (Quorn), J. H. Bottrall and J. C. W. Keller (Appila-Yarrowie), M. Eckert (Arden Vale and Wyacca), J. C. Ruwoldt (Mount Gambier), J. H. Knappstein (Clare), J. Brown and W. E. Hargreaves (Port Elliot), C. H. Meyers (Dawson), W. H. Waters (Renmark), D. Hanna and J. Monfries (Gumeracha), J. Binney, R. W. Kleinschmidt, and A. S. Hughes (Willunga), C. W. Fowler, R. W. Salter, A. Friend, and S. Plush (Woodside), J. McKenzie (Minlaton), G. E. Pattingale (Port Broughton), and P. Anderson (Balaklava).

THE WHEAT MARKET.

Under date London, July 25th, *Beerbohm's Corn Trade List* states :—" As will be seen in the following table present indications are for a world's wheat crop about 14 million quarters larger than last year, whilst if this year's crop be harvested in fair to good condition, the amount of millable wheat may exceed last year's by 25 to 30 million quarters. Practically the whole of the anticipated increase is in European countries. The consumption of wheat has been very large during the past twelve months, and of course is steadily increasing each year.

THE WHEAT CROP OF THE WORLD.
(Preliminary Estimate.)
(In Quarters of 480lbs., 000 omitted.)

	1913.	1912.	1911.	1910.	1909.	1908.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.
*Austria	6,500	7,200	7,500	7,200	7,300	7,800
†Hungary	19,500	23,000	24,000	22,700	14,200	19,000
Belgium	1,800	1,900	1,800	1,550	1,750	1,750
Bulgaria	8,050	8,000	8,000	7,100	4,600	4,500
Denmark	500	450	500	550	500	500
France	41,500	41,700	40,300	31,500	44,500	39,500
Germany	19,000	20,000	18,700	17,700	17,200	17,270
Greece	700	700	750	650	750	750
Holland	700	700	700	550	750	600
Italy	24,800	20,800	24,000	19,200	23,800	21,000
Portugal	900	800	1,000	800	700	400
Roumania	9,000	10,000	12,500	13,400	6,900	6,700
Russia	105,000	90,500	67,000	102,800	97,600	71,000
Servia	1,800	1,700	1,900	1,650	1,800	1,750
Spain	14,000	13,700	18,500	17,200	17,200	14,500
Sweden	900	900	1,000	900	800	720
Switzerland	450	400	500	350	550	500
United Kingdom	7,200	7,100	8,000	6,500	7,900	6,750.
Total for Europe	262,300	249,550	236,700	252,300	248,800	218,500
Algeria and Tunis	5,500	3,000	5,500	5,700	5,100	4,100
Argentine Republic	21,000	25,000	20,700	18,200	16,500	20,150
Australasia	12,000	12,000	9,900	13,100	12,400	9,500
Canada	28,000	26,000	27,000	18,700	21,000	14,000
Chili	2,500	2,500	2,200	2,300	2,300	2,175
Egypt	4,000	3,600	4,700	4,000	3,900	2,250
India	44,500	45,800	46,300	44,600	35,370	26,750
U.S. America	92,000	91,000	78,000	79,400	88,000	80,000
Uruguay	1,200	1,200	1,200	1,300	1,250	1,000
Japan	3,300	3,200	3,100	2,700	2,800	2,900
Total out of Europe	214,000	213,300	198,600	190,000	188,620	162,825
Grand total	476,300	462,850	435,300	442,300	437,420	381,325

* Including Bosnia and Herzigovina. † Including Slavonia and Croatia.

In its issue of August 1st the same paper states :—Most of the advices received from America this week are to the effect that winter wheat will prove to be a larger crop than officially estimated on the 1st of July. Both yields and quality are reported to be above the average. Receipts at Western Points are now on a very large scale, so that although the shipments last week were much larger than in the corresponding week last year, *Bradstreet's* " visible " showed a large increase, against a very slight decrease in 1912. Spring wheat, both in the United States and Canada, is progressing satisfactorily, the weather having been very favorable. If the *North-Western Miller's* estimate of a yield of 200 million bushels in the two Dakotas and Minnesota prove correct, the total yield of spring wheat (after allowing for a falling off in the other States at the same rate as for the three principal spring wheat States), would amount to 250 million bushels, against 330 million bushels last year, and would indicate a total yield of winter and spring wheat of 750 million bushels, against 730 million bushels last year.

Date.	LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
Aug. 5	Quiet	3/6½ to 3/7	3/7¾ to 3/8	3/7¼ to 3/7½
6	Do.	Do.	Do.	Do.
7	Dull, with easier tendency	Do.	Do.	Do.
8	Do.	Do.	Do.	Do.
9	Dull	Do.	Do.	3/7 to 3/7¼
11	—	Do.	Do.	Do.
12	Very dull	Do.	Do.	Do.
13	Very dull and lower to sell; no demand	Do.	Do.	Do.
14	Dull, no demand	Do.	Do.	3/7
15	Steady, but quiet	Do.	Do.	Do.
16	Steady, but quiet; Liverpool quiet; May-June 4/6	Do.	Do.	Do.
18	—	Do.	Do.	3/6¾
19	Steady, but quiet	Do.	Do.	3/6¾ to 3/7
20	Quiet; Australian off coast, buyers at 4/5⅝	Do.	Do.	Do.
21	Steady, quiet; Australian, arrived, 4/5⅝; afloat, 4/6; Liverpool, steadily held, not active	Do.	3/7½	3/6½ to 3/7
22	Firm; Liverpool steady, quiet	Do.	Do.	Do.
23	Firm; Liverpool firm, but quiet	Do.	Do.	Do.
25	—	Do.	Do.	Do.
26	Quiet; Liverpool quiet, with easier tendency	Do.	3/7½ to 3/7¾	Do.
27	Quiet; Liverpool steady, quiet; Australian, arrived, 4/6⅛	Do.	Do.	Do.
28	Quiet	Do.	Do.	Do.
29	Do.	Do.	Do.	Do.
30	Dull, easier tendency; Liverpool quiet	Do.	3/7½ to 3/8	3/7
Sept. 1	—	Do.	3/7 to 3/7½	3/6½ to 3/7
2	Very weak, 3d. lower; Liverpool quiet	Do.	Do.	Do.
3	Very dull; Liverpool quiet	Do.	3/7½	3/7
4	Steady, not active; Liverpool steadily held, not active	Do.	Do.	Do.
5	Steady, no quotation; Liverpool firm, but quiet	Do.	Do.	Do.

STEAMER FREIGHTS.—(September 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 30s. per ton (9⅗d. per bushel); to South Africa, 27s. 6d. per ton (8 9/10d. per bushel); Parcels, Port Adelaide to London-Liverpool, 28s. per ton (9 1/10d. per bushel); to Continent, 25s. per ton (8d. per bushel); Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel); to Sydney, 10s. 6d. per ton (3¼d. per bushel).

SAILER FREIGHTS.—From South Australia to United Kingdom-Continent, 31s. 3d. per ton (10d. per bushel); to South Africa, 26s. 3d. per ton (8⅖d. per bushel).

RAINFALL TABLE.

The following table shows the rainfall for August, **1913, at the undermentioned stations, also the average total rainfall for** the first eight months **in the year, and the total for the eight months of 1912 and 1913 respectively :—**

Station.	For August, 1913.	Av'ge. to end August,	To end August, 1912.	To end August, 1913.	Station.	For August, 1913.	Av'ge. to end August,	To end August, 1912.	To end August, 1913.
Adelaide	2·11	15·01	12·32	9·24	Hamley Brdge	2·32	11·58	7·91	8·34
Hawker	1·42	8·25	7·72	4·04	Kapunda	2·64	13·83	9·33	11·49
Cradock	1·27	7·31	5·12	4·30	Freeling	2·06	12·52	9·74	12·63
Wilson	1·10	8·00	7·80	4·20	Stockwell	2·33	14·23	11·33	10·94
Gordon	0·92	5·97	6·35	3·91	Nuriootpa	1·93	14·96	11·38	10·20
Quorn	1·23	9·54	11·16	4·15	Angaston	2·67	15·25	13·70	14·08
Port Augusta	0·52	6·23	6·98	3·11	Tanunda	3·24	15·64	16·28	14·14
Port Germein	1·42	8·59	6·95	4·24	Lyndoch	3·60	16·34	12·64	12·12
Port Pirie	1·60	8·87	6·52	5·01	Mallala	1·72	11·87	8·43	7·71
Crystal Brook	2·02	10·46	9·49	5·18	Roseworthy	1·57	12·25	8·60	8·02
Pt. Broughton	1·68	9·96	8·92	5·20	Gawler	2·08	13·68	9·57	9·08
Bute	1·99	10·91	8·27	7·54	Smithfield	1·84	11·76	9·14	8·54
Hammond	0·72	7·37	6·73	3·29	Two Wells	1·44	12·16	7·33	6·53
Bruce	0·51	6·14	7·96	3·84	Virginia	1·45	12·65	8·81	7·59
Wilmington	1·72	12·36	13·71	5·47	Salisbury	2·20	13·36	10·00	9·55
Melrose	2·79	16·11	14·47	6·92	Teatree Gully	3·41	20·16	15·33	11·75
Booleroo Cntr.	1·58	10·76	8·01	3·99	Magill	3·33	18·62	14·02	11·37
Wirrabara	3·01	13·00	12·03	7·31	Mitcham	2·80	19·72	11·72	10·73
Appila	1·22	9·94	12·37	4·01	Crafers	6·46	34·03	23·89	21·20
Laura	2·73	11·99	9·13	5·94	Clarendon	3·58	24·98	15·65	13·72
Caltowie	2·30	11·34	8·41	6·15	Morphett Vale	2·31	17·15	11·14	10·30
Jamestown	2·58	11·38	12·08	6·78	Noarlunga	1·96	14·84	10·75	7·77
Gladstone	2·10	10·53	8·16	5·63	Willunga	2·78	19·06	12·80	13·02
Georgetown	2·95	12·56	10·69	6·86	Aldinga	2·25	14·97	9·90	10·71
Narridy	1·77	11·63	9·45	4·79	Normanville	2·62	15·32	9·33	10·84
Redhill	2·42	11·57	10·50	6·52	Yankalilla	3·20	16·62	11·74	13·66
Koolunga	1·70	10·92	9·19	5·19	Eudunda	1·96	11·74	9·72	9·85
Carrieton	0·99	8·12	7·46	3·49	Sutherlands	1·01	—	6·88	6·04
Eurelia	1·11	8·83	8·71	3·34	Truro	2·97	13·58	13·86	14·50
Johnsburg	0·86	6·49	7·68	3·34	Palmer	1·92	—	9·34	10·13
Orroroo	1·31	9·34	8·05	4·45	Mt. Pleasant	3·72	19·44	12·92	14·31
Black Rock	1·29	3·37	7·73	4·36	Blumberg	4·40	21·74	14·23	11·58
Petersburg	1·07	8·55	8·63	6·30	Gumeracha	4·55	24·05	16·74	15·13
Yongala	1·33	9·11	7·56	4·47	Lobethal	5·38	26·23	16·02	15·78
Terowie	1·22	8·86	7·42	5·13	Woodside	5·33	22·67	16·21	16·46
Yarcowie	1·42	9·11	8·33	6·43	Hahndorf	4·88	25·58	13·34	17·84
Hallett	2·32	11·08	8·88	7·63	Nairne	3·50	20·63	12·52	13·51
Mount Bryan	2·72	10·77	9·79	9·41	Mt. Barker	4·50	22·32	14·39	15·95
Burra	2·51	12·25	11·31	7·76	Echunga	4·36	23·54	15·60	15·60
Snowtown	2·10	11·07	9·04	5·82	Macclesfield	3·78	21·70	13·44	16·53
Brinkworth	2·40	10·17	9·74	7·44	Meadows	4·78	25·51	17·07	18·85
Blyth	1·85	11·31	8·19	7·01	Strathalbyn	2·35	13·57	9·87	11·98
Clare	4·03	17·11	12·54	11·01	Callington	1·89	11·21	6·16	8·79
Mintaro Cntrl.	3·72	15·37	9·90	9·28	Langh'rne's B.	1·32	10·66	6·45	7·36
Watervale	3·48	19·38	12·27	12·52	Milang	1·05	12·14	6·17	6·18
Auburn	3·14	16·94	9·11	9·09	Wallaroo	1·40	10·07	10·95	6·62
Manoora	2·05	12·45	7·54	7·11	Kadina	1·76	11·63	10·06	6·56
Hoyleton	2·13	12·93	6·78	6·27	Moonta	2·24	11·16	9·23	7·98
Balaklava	1·60	11·21	6·37	5·32	Green's Plns.	2·36	11·48	8·09	6·71
Pt. Wakefield	1·33	9·50	6·72	5·51	Maitland	2·76	14·82	9·61	9·51
Saddleworth	2·44	14·08	7·94	8·83	Ardrossan	2·51	10·09	7·41	7·96
Marrabel	1·88	12·32	7·06	7·84	Pt. Victoria	2·07	11·17	8·54	6·26
Riverton	2·54	14·40	8·09	9·65	Curramulka	2·53	13·81	8·54	8·67
Tarlee	2·21	12·16	8·39	8·69	Minlaton	2·26	13·09	8·68	6·80
Stockport	2·37	11·22	8·23	8·78	Stansbury	2·00	12·42	9·34	8·90

RAINFALL TABLE—*continued.*

Station.	For August, 1913.	Av'ge. to end August.	To end August, 1912.	To end August, 1913.	Station.	For August, 1913.	Av'ge. to end August.	To end August, 1912.	To end August, 1913.
Warooka.....	1·93	13·34	7·54	6·94	Bordertown...	2·31	13·47	8·31	9·93
Yorketown .	1·97	12·98	9·05	6·90	Wolseley ...	2·40	11·85	7·85	8·86
Edithburgh .	1·91	12·19	8·31	8·21	Frances	3·07	13·61	10·33	9·49
Fowler's Bay.	1·30	9·60	8·25	7·49	Naracoorte .	2·96	15·56	11·52	11·46
Streaky Bay.	1·52	11·86	11·55	7·82	Lucindale ..	2·95	16·57	11·77	10·55
Port Elliston.	1·68	12·66	12·00	5·88	Penola.......	3·69	18·71	14·77	11·82
Port Lincoln.	1·90	15·16	14·48	8·18	Millicent ...	5·43	21·43	17·06	18·23
Cowell	0·52	8·31	7·17	3·93	Mt. Gambier.	5·15	22·44	17·33	17·25
Queenscliffe...	2·50	14·00	11·81	9·96	Wellington .	1·24	10·37	7·04	7·63
Port Elliot .	1·92	14·95	9·92	9·48	Murray Brdg.	1·27	9·76	6·05	10·37
Goolwa......	2·02	12·77	10·56	9·03	Mannum ...	0·74	8·18	4·37	6·71
Meningie ...	2·18	13·66	8·94	8·44	Morgan	0·31	5·83	5·88	3·58
Kingston....	2·89	18·33	19·85	12·14	Overlnd. Crnr.	0·38	7·27	6·13	6·57
Robe	3·99	18·81	12·80	12·91	Renmark ...	0·39	6·72	5·61	6·55
Beachport...	5·43	20·84	14·62	16·44	Lameroo ...	1·79	—	9·90*	9·62
Coonalpyn ..	2·90	12·30	9·32	9·50					

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TO ADVERTISERS.

The "Journal of Agriculture" has a circulation of over 6,500 Copies monthly amongst the Cultivators of the Soil in South Australia, and consequently is a valuable medium for advertising Farm and Orchard Supplies and Requisites.

Particulars as to charges for space on application to the Department of Agriculture, Adelaide.

DAIRY AND FARM PRODUCE MARKETS.

The General Manager of the Produce Department reports on September 1st:—

BUTTER FACTORY.

The beneficial showers experienced last month resulted in a decided increase in the quantity of cream received, the general quality being excellent. Butter is in great demand, but prices eased slightly during the month. Present rates are—superfine, 1s. 2d. per pound; and pure creamery, 1s. per pound.

A. W. Sandford & Co., Limited, report on September 1st—

Butter.—During August supplies of butter and cream increased, and values in butter are therefore somewhat easier than a month ago. Best factory and creamery, fresh in prints, is selling at 1s. 0½d. to 1s. 2½d. per lb.; choice separators and dairies, 10½d. to 1s.; store and collectors', 9½d. to 10½d. per lb.

Eggs.—Rates remained fairly stationary throughout, for, although considerably larger quantities are reaching market, the active demand has readily cleared all parcels offering, local picklers and others being busy putting away for future wants. Guaranteed new-laid hen, 9¾d. per dozen; duck, 10¼d.

Cheese.—The prices that were secured at the beginning of last month attracted importations, and with local supplies showing a substantial increase values have come back equal to export rates, viz., 6d. to 6½d. per lb. for large to loaf.

Honey.—As it is getting late in the season there is only a limited supply left now of prime clear extracted, and orders are not able to be fulfilled at 3d. per lb.; second grade range from 1½d. to 2d. Beeswax is in good request at 1s. 1d. to 1s. 2d.

Almonds are practically cleared at late quotations, with kernels showing an advance of nearly 2d. per lb. Quotations.—Brandis, 5¾d.; mixed soft shells, 5¼d.; hard shells 3d.; kernels, 1s. 5d.

Bacon.—The shortage in the live hog continues, and prices throughout have been high. Best factory-cured sides are selling at 9½d. to 10½d.; cooked hams, 1s.; uncooked 10d. to 10½d.; well cut and cured farm middles and rolls, 7d. to 9d.; country hams, 8d. to 10d.

Live Poultry.—Extremely active sales have ruled throughout the month, no doubt the high price of meat causing a much heavier inquiry for poultry, so that all consignments have been cleared at advancing rates. Good table roosters brought 3s. 6d. to 3s. 10d. each; plump hens and nice-conditioned cockerels, 2s. to 3s.; only a couple of coops of light sorts lower; ducks, 2s. 9d. to 3s. 9d.; geese, 4s. to 4s. 9d.; pigeons, 9¼d.; turkeys from 7d. to 10d. per lb. live weight for medium to prime table birds.

Potatoes and Onions.—The potato market is in a glutted condition owing mainly to the exceptionally heavy yield in Victoria. The demand for Gambiers has been exceedingly small for the time of year, and prices have again eased. Onions.—There has been no difficulty in obtaining adequate supplies of onions, and values are unchanged. Quotations.—Potatoes, £3 15s. per ton on trucks Adelaide or Port; 4s. 6d. to 6s. per cwt. in the market. Onions.—£7 10s. per ton on trucks Adelaide or Port; 8s. to 9s. per cwt. in the market.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

ANNUAL CONFERENCE OF EYRE'S PENINSULA BRANCHES.

COWELL, AUGUST 1st.

The Annual Conference of Branches of the Agricultural Bureau situated on Eyre's Peninsula, was held at the Institute, Cowell, on August 1st. Messrs. F. E. Place, B.V.Sc., M.R.C.V.S. (Veterinary Lectuier), P. H. Suter (Dairy Expert), A. M. Dawkins (Member Advisory Board), and H. J. Finnis represented the Department of Agriculture, and the following delegates were present :—Utera Plains—Messrs. A. Ramsey, J. Norton, M. Hunt, J. Abrook, M. Abrook, G. Hornhardt, A. Venning, W. E. Hier, N. Guidera, W. Gale, E. Sinclair ; Miltalie—T. A. Wilson, P. G. Wilson, J. W. Story, E. Story, J. P. Story, C. E. Scarle ; Elbow Hill—W. T. Cooper, Geo. Wake, A. Wake, S. V. Wake, C. Wake, E. Wake, H. Wheeler, P. Wheeler, C. T. Jacobs, A. Chilman, F. Freeth, G. Dunn, J. F. Brook, A. R. S. Ramsey ; Mangalo—J. H. Cleave, J. W. Deer, J. C. Busch, H. Mackley ; Yabmana—J. N. McCallum, H. McCallum, A. McCallum, G. Story, B. Frost, A. Robertson, J. Robertson ; Roberts and Verran—R. Johnson. A number of visitors also attended.

The chair was occupied by Mr. A. Ramsey, of the Utera Plains Branch, and local arrangements in connection with the Conference were carried out by Mr. T. A. Wilson as secretary to the committee.

CHAIRMAN'S WELCOME TO DELEGATES.

The Chairman (Mr. Ramsey) extended a hearty welcome to the officers of the Department and the visiting delegates. He drew attention to the excellent services rendered the agricultural interests of the State by the ex-Chairman of the Advisory Board, and called on that gentleman to address the gathering.

WHEAT DISEASES.

Mr. A. M. Dawkins expressed his pleasure at being able to attend the Conference, and congratulated the district on the general appearance of the town of Cowell, and the industry and thrift that had been displayed in connection therewith. He did not wish them to understand that he was a scientific man in so far as wheat was concerned, but he addressed them as a practical farmer. Dealing with diseases which affected the wheat plant, he mentioned that red rust was one of the greatest curses with which the farmers had to contend. Frequently it had happened that when the wheat was ripening there would be a monsoonal depression, and a number of red specks on the plants would develop, and increase to red streaks, and instead of a 20-bush. harvest there would be perhaps a return of 3bush. or 4bush. So serious was the position, that in 1884 the Government offered a reward for the discovery of a satisfactory means of dealing with the fungus. Sprayings were advocated without very much success. Dr. Cockburn, in the Legislature, stated that the remedy would have to come from the wheat plant itself. He was aware of the fact that phylloxera, which had wrought such great havoc amongst the vines in France, had been brought into subjection by the introduction of a vine capable of resisting the disease. The woolly aphis of the apple had also been combated by the same method of grafting the trees to blight-proof stocks. Shortly after this Mr. J. Ward discovered amongst his wheat plants a few which seemed to have resisted the rust. These he selected and planted, and in a few years he was able to supply a variety known as Ward's Prolific. It was hard to thrash and yielded a red chaff, and whilst it was satisfactory for growth in some districts, in others the yield was so poor that it would pay to grow other varieties with the risk of their being attacked by the rust. The matter was then taken up by Mr. Marshall, who introduced Marshall's No. 3; and Mr. Farrer, of New South Wales, also undertook the work of crossbreeding and selecting, and he produced some wheats that were immune to the fungus. In the early days, when no artificial manures were used, the period between the time the wheat came out into head and the ripening of the grain was longer than was the case since fertilisers were used. It was at this stage that the rust attacked the plant, and with the shortening of the time during which the wheat was liable to be affected had come less trouble with the disease. In South Australia, to-day, red rust was practically a thing of the past, and he did not think it would ever suppress the yields to the extent it had done years ago.

SMUTS.

There were three other diseases with which he would deal, viz., bunt, loose smut, and flag smut (or black rust). Bunt, or ball, or stinking smut was one of the most injurious diseases that was met with, because it not only destroyed the plant itself, but it would spoil the grain also. When the spores of this fungus came into contact with the wheat grain and adhered to it after sowing they germinated with and entered the young wheat plant, and grew with it, the fungus reproducing itself in the ear, and myriads of spores together forming the familiar bunt ball which took the place of the grain. These spores were capable of germination on most plants in subsequent crops under suitable conditions. The best means of dealing with bunt, loose smut, and black rust was pickling in a solution of bluestone before sowing. He had tried other solutions, but they had not equalled bluestone. Formalin had the advantage that it did not retard germination, but it interfered with the working of the seed through the drill; otherwise it was a very good pickle indeed. The correct strength of bluestone to use was 1 per cent., *i.e.*, 1lb. of bluestone to 10galls. of water. A stronger solution would further retard the germinating power of the wheat, and in some cases destroy it altogether. The wheat should be put out on to the floor, and sufficient solution should be poured on to it to average about 1oz. of bluestone to the bag of wheat. They should remember that each grain of wheat was enclosed in a film of air, and it was essential that the solution should come into contact with the whole surface of every grain. This was effected by turning it over three times on the floor, when three or four bags at a time were being dealt with. It was a decided advantage to do the pickling before seeding was commenced; the wheat dried, and the work was not so rushed. Later sown wheat usually contained more smut than that sown early. When the ground was just damp enough to germinate any smut spores in the ground, but not sufficient to cause the wheat to grow, there was little danger of trouble with the disease, as in the absence of a host plant the fungus died.

TAKEALL.

This had been the cause of considerable trouble during the past two or three years. The crops appeared to be doing well, when a small circle of diseased wheat became noticeable, and this gradually spread. This was caused by a fungus which attacked the wheat plant level with the surface of the ground, worked right round it, and èventually destroyed it. after a hot wind, plants attacked by takeall generally went off much more quickly. There was one way of getting rid of it, and that was by keeping the land absolutely clean when fallowing, and preventing the growth of any grass on which the fungus would thrive, and then by growing oats. In the Wimmera district they found it difficult to deal with spear and barley grasses, and it was there necessary to grow two crops of oats in succession, after which, they could again put in wheat. Oats generally made excellent chaff and there was a good market for the grain, but his experience with this crop was that it was necessary to sow it early, and get the plants above the ground with the first rains. He preferred putting the seed in during April. If the sowing were left until the cold weather came they would not do so well.

DISCUSSIONS AND QUESTIONS.

Mr. A. Ramsey (Utera Plains) desired to know whether it was advisable to pickle wheat on wooden instead of cement floors. Some authorities had recommended the use of 1½lbs. of bluestone to 10galls. of water.

Mr. Dawkins replied that wooden floors and utensils were best, as with iron and cement there was the likelihood of a slight reversion of the bluestone. If iron shovels were used they could be coated with a little boiled oil, which would minimise the reversion. Whilst up to 2 per cent. solution had been recommended, his experience was that 1 per cent. was quite strong enough to kill the fungus, which was all that was necessary.

Mr. Abrook (Utera Plains) had found that wheat put loosely in a bag, dipped in the solution, and well stirred would become uniformly covered.

Mr. J. F. Brooks (Elbow Hill) asked how much wheat could be pickled with 10galls. of solution.

Mr. Dawkins said that so long as the wheat became thoroughly saturated, the aim was effected.

Mr. F. A. Wilson (Miltalie) used about ½gall. of solution to pickle 1bush. of grain.

Mr. W. Cooper (Elbow Hill) used 1lb. of bluestone to 4galls. of water with the floor method of pickling. With this he treated about four bags of wheat.

Mr. Dawkins had seen crops on new land affected by takeall, but he would not advise them to sow oats just on that account for the first year.

Fallowing in New Land.

Mr. J. N. McCallum (Yabmana) read a paper under the heading "Farming in the Franklin Harbor District" as follows:—"In the first place, the holdings in this district in most instances are too large to allow of economic working. Rents, rates, and taxes are being paid on land which is a run and breeding ground for vermin. With land that is being treated for the second or third crop after clearing it is the usual custom to plough or cultivate, and drill the seed in with the straw and shoots still on the ground. It has proved a profitable undertaking to cut, rake, and burn the shoots before ploughing. If there is sufficient straw the fire rake can be used with advantage, but nevertheless I recommend cutting the shoots. Of course, if there is sufficient stubble to burn, all this trouble will be dispensed with. I would strongly recommend fallowing after the third crop, having proved that there is more profit in one fallow crop than two off stubble land. Some farmers put too much under crop in one year in comparison with their working plant. If the effort were concentrated on a smaller area, and better work done on that, there would be a better average for the district. The great drawback in scrub country is the question of feed, and there is room for improvement in the methods adopted for securing this. Thirty pounds of oats drilled in with, say, 30lbs. of super. per acre will generally give good feed by July. On older land on which the shoots and a good part of the stumps have been destroyed, fallowing must be done if we are to be successful. We have at best a light rainfall, and early fallow will materially help to grow a better crop by conserving the moisture. The ploughs should be at work early in June; the end of July should see the work completed. In any case it should not be later than the end of August, in order to allow time for subsequent working. I have proved that that which can be accomplished in districts on the other side of the gulf can be done here by judicious and systematic working. I have at present good feed as the result of drilling 30lbs. of oats and 30lbs. of super. on the stubbles, and a promising wheat crop on early well-worked fallow."

Other Views.

Mr. Abrook (Utera Plains) said the general practice in his district was to put as large an area under crop as they could. Dry-farming methods were not successful; fallowing was not satisfactory. If they secured a small average from a large area that was better to them than a larger return from a small area.

Mr. W. Gale (Utera Plains) believed that fallowing was the best practice. Last year he worked a fallowed area well, and there was a large difference between the crop on that and those on land not fallowed. One difficulty, however, was to keep the land from drifting.

Mr. G. F. Wake (Elbow Hill) agreed with most of the ideas expressed in the paper. Last year he reaped 13bush. per acre from fallowed land and only 5bush. or 6bush. from stubble. Second crops on fallow were in some instances almost as good as first. Holdings in this district were too large in some instances.

Mr. A. Ramsey (Utera Plains) had secured good crops of feed by drilling oats on stubble. One thousand acres was not too much for a good farmer in this district. Last week he went through to Darke's Peak, and in his opinion all the good country would be mopped up by six farms.

Mr. A. Dawkins very much favored small holdings and the work being done well. There was a danger of the farmer undertaking more than he could successfully manage. Rape might well be included when they were sowing oats for feed ; barley also might do well. This was a cereal that finished off more quickly than wheat, and it came in before oats were ready for early feed.

Mr. McCallum, in reply, said he had tried kale with the hay crop. He had a strong working plant, and although the area he held was large, he had it well in hand. He thought it a great mistake to leave shoots on the ground after the crop was put in.

Initial Cost of Farming.

Mr. F. J. Brooks read a paper, from which the following is taken :—" The initial cost of farming must, in my opinion, ever be a fruitful source of controversy. Men start under such diverse circumstances and conditions that, speaking generally, it would be extremely difficult, if not impossible, to arrive at any finality in fixing any sum with which a man could successfully start farming, and although the total arrived at in this paper represents quite a large sum of money for a beginner, I would not for a moment have anyone think that it could not be done for less, or that I would debar any from going upon the land with a smaller amount of capital. On the contrary, I would give the land to every man that asks for it quite irrespective of the amount of capital he may possess. As proving that want of capital is not necessarily a bar to success, I would quote just one instance out of a number which have come under my notice in this district. A man back in the early eighties (when times, by-the-way, were not too good) took up some scrub land under the old credit selection system. After paying the 10 per cent. deposit which was then necessary he had but 4s. 6d. in the world, besides a wife and family. That man, however, succeeded, and a few years ago died, leaving a nice farm, a complete working plant, and a nice little bank balance. Again, others could be quoted who have started with a good plant, a fair amount of capital, and apparently with success assured, and yet have failed utterly. Doubtless, most men here to-day could quote similar instances; therefore, as before stated, I contend that neither capital or the want of it are prime factors in determining the success or failure of the beginner on scrub lands. The qualities, however, which are indispensable are economy, foresight, good management, industry, grit, indifference to hardships and, lastly, luck; for though, generally, luck is not allowed a place in modern farming, I am sure there are many here to-day who will admit that there is a large element of luck in everything pertaining to wheat-growing. Indeed, I know of no other term applicable to the chances which have been known to secure to one man a fair crop, while his neighbor, an equally careful, industrious, and farseeing man may suffer an almost complete failure. What is it but luck which, for instance, prompts one man to choose for seed for the main part of his crop a certain kind of wheat, while his neighbor, acting upon the experience of the past, sows that which has yielded him good returns. The season turns out a 'rusty' one. The first, being rust proof, yields a good crop; the latter, being a non-resisting variety, is a failure. Or, again, a thunderstorm falls upon one man's land and thoroughly soaks it just in the nick of time, securing to him good returns; his neighbor gets scarcely a drop of it and his crop is consequently a failure; and though such cases are of rare occurrence, doubtless every farmer of experience will know of instances similar to those mentioned; and although they have no direct bearing on the initial cost of farming, and so cannot be taken into account, they are still very potent factors in determining the success or failure of a farm started on a given amount of capital, and would lead one man to say, 'Well! I started on such-and-such an amount of capital and have done well.' While the other would say, 'It cannot be done for so much. I started with that amount, farmed well, have been careful in everything, and am in debt.' The nature of the scrub again, whether big or small timber, and the nature and quality of the land, whether hard or soft, must have a direct bearing on the cost of starting a farm. Heavy scrub must, of course, cost more to clear than light; and hard, gritty land must cost considerably more in wear and tear in ploughshares and in strength than soft land. Again, a man's family must be taken into account. He may be a married man with encumbrances, or he may be a married man with a lot of helpers. He may be in close proximity to a good market where he can easily dispose of all he can produce, and where haulage to port or railway station would cost but little, or he may be far back, almost without market at all for by-products, and where haulage to and fro is a very serious item. He may have good feed country where cost of feed would scarcely be taken into account, or he may have land which, until cleared, will grow no feed at all, where cost of feed may be the most serious item he has to consider. Accessibility to water, too, must be a factor in determining the cost of starting a farm. These are a few of the things which must be taken into consideration. From my experience of farming, one never knows what source of expenditure will open out next, so that, as before stated, it is almost impossible to fix upon any given sum with which a man could start a farm with a fair hope of success, except under a given set of circumstances; and as no given circumstances are likely to be applicable, even in 10 cases in a hundred, the figures given herewith can only be taken as a guide in circumstances similar. In the figures appended I am giving what I estimate to be the cost of the indispensable requirements of a man starting a farm in full-going order. I am allowing for a bachelor starting on 1,000 acres of fair average scrub land, not too far from market, but without other advantages such as feed or water, buying everything new, and paying cash for all requirements. It will be found on analyses, that the figures are rather under than over the mark; but the result is, to my mind, certainly somewhat surprising, viz., £899 13s. 4d. The beginning is a very modest one at that. Of course, as before stated, one may commence farming for less; we all know it is often done for less; but under the circumstances given above I cannot see that any less or at any rate any materially less amount would suffice. Appended are the figures referred to, viz.—Six horses at £25 per head, £150; two knockabouts at £10 per head, £20; harness, £28; wagon, £60; six-furrow plough, £40; drill, £40; harrows, £6; stripper, £50; winnower, £25; buggy, £35; horse feed, 20 tons hay at £4, £80; seed wheat for 200 acres, ¾bush. to acre at 10s. per bag, £25; 5 tons super. at £4 10s. per ton, £22 10s.; household requisites, £10; tools and sundries, £10; house, £10; material for fencing, say, 2½ miles, including netting under loan system, about £15; logging and clearing 200 acres scrub at 8s. per acre, £80; wages, fencing, ploughing, harvesting, &c., £45; rent and lease fees, 1,000 acres at 4d. per acre, £18 3s. 4d.; provisions and clothing, &c., £50; contingencies, £50; water conservation, £30—£899 13s. 4d."

Mr. McCallum (Yabmana) thought £800 sufficient for a farm to make a good start.

Mr. Abrook (Utera Plains) said there would be few men growing wheat if they had to wait until they had £800 with which to commence. Some men had started practically with nothing.

Mr. R. Johnston (Roberts and Verran) thought the success of the venture rested as much with the man as with the amount of capital he had at his disposal. A man with grit and experience could start with far less than £800. However, circumstances altered cases. A few years ago it was necessary to pay £40 or £50 per head for horses, but their cost was not nearly so much at present.

Mr. P. G. Wilson (Miltalie) thought the estimate of requirements made by the writer of the paper rather high. A man could start with far less than £800.

Mr. Brooks, in reply, said he did not contend that the amount necessary for a man to start farming was £800. Some men living in retirement at the present time commenced on practically nothing; £899 13s. 4d. was the requirements of a man starting under conditions specified in the paper.

Afternoon Session.

FRUIT AND VEGETABLES FOR THE FARM.

In a paper on this subject, Mr. J. W. Deer (Mangalo) said land intended for fruit trees should be of a deep, loamy nature, somewhat sandy, with a clay subsoil. The site should be well sheltered, and in the hills if possible. A one-way garden plough and a harrow or cultivator would facilitate working. Before planting, all stumps and roots should be grubbed from the land and a good dressing of well-rotted stable manure applied. Ploughing to a depth of 6in. or 8in. should follow this, and the growth of weeds caused by autumn rains should be checked by the cultivator. Holes for the trees should be about 3ft. square and 3ft. deep and 22ft. apart each way, the surface soil being placed in the holes first after the trees were put in. A few rows of vegetables could be placed between the trees, these being supplied with plenty of manure each year. Early varieties of apricots, peaches, plums, figs, apples, pears, and cherries might be tried. Grapevines should be trellised. Almond trees placed 15yds. from the other fruits would make a good break round the garden. From 100 to 150 trees would supply the requirements of the average farmer. When it was intended to grow vegetables commercially the land on which these were planted should be fallowed every second year. Vegetables which did well in this district were early cabbages and cauliflowers, Egyptian turnip-rooted beet, turnips, carrots, parsnips, radish, lettuce, peas, onions, all of which could be planted during April and

May. Cabbages and cauliflowers should be 18in. apart in rows 2ft. apart. For other vegetables the rows should be 2ft. apart, beetroot and lettuce being 1ft. apart in the rows, and others from 3in. to 6in. apart. Potatoes, which paid well in this district, should be 18in. apart in the rows, being buried to a depth of between 4in. and 5in. The best sorts were Pinkeyes, Flourballs, Carmens, and Up-to-Dates ; these should be planted in August and earthed up when about 6in. high. It was not advisable to sow the same vegetable for two years in succession on the one piece of land. Cabbages, cauliflowers, and peas should be followed by root crops.

THE DISCUSSION.

Mr. Alm mentioned that fruit and vegetables did especially well in the hills. He did not favor planting vegetables between fruit trees. From 18ft. to 20ft. was sufficient between the trees. It was a good idea to build a mound of earth in the centre of the hole and place the roots of the tree on and around this.

Mr. Dawkins (Advisory Board) thought the paper a very practical and useful one. On the whole he agreed with the writer, but it was advisable to keep the fruit trees and vegetables in different places; it was a question of moisture. For the first two or three years little harm would be done, but the nourishment that the vegetables took from the ground affected the trees eventually. There was always a danger in connection with working a farm and a garden together, and that was that the farmer might neglect his wheatgrowing. It was always wise for the farmer to have a small garden, but it did not pay to leave the team idle whilst potatoes were being planted.

HOME SURGERY.

The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) delivered an instructive address on this subject. In dealing with wounds in farm stock he said every attention should be given to cleanliness. It was much better to leave nature to do the cleansing than to put mixtures or disinfectants into the water to be used in the dressing. He explained the method of throwing a beast single handed, and pointed out the uses and principle of the twitch. An excellent embrocation could be made from equal parts of turps and vinegar, ammonia and sweet oil. Probably one of the most successful surgical aids which had been introduced into the veterinary science was the mop with tar. Iodoform was an excellent application for wounds, but the price was high. An equally effective mixture was boracic acid, seven parts, and flowers of sulphur, one part, and it did not carry with it the offensive odor attached to the former. Formalin was an excellent disinfectant, but it hardened up the albumen of the new cells which were forming over the wound and prevented their development. Lysol and such like were good, but their virtues were those of tar, and there was no advantage in their use in preference to this. Medicated oils were good, but their virtues consisted of the iodine they contained. If they purchased a little pure iodine and put enough to lie on a shilling piece into a bottle of methylated spirits, they would have an efficient wet dressing.

MAKESHIFT APPLICATIONS.

Vinegar and water constituted a very good temporary dressing. Turpentine was equally good. Salt and pepper also were excellent first-aid dressings. When joint oil was running, ordinary washing soda was not to be despised. Washing soda and Condy's crystals would be found excellent dressings for large wounds. In 99 cases out of 100 it was not necessary to worry about a horse losing a lot of blood. All animals fainted when they lost too much blood, and as a result bleeding stopped. When an animal bled to death it generally expired within a few minutes. If blood were squirting from an artery, pressure would stop it. Very hot water applied to wounds bleeding badly would kill any germs, and at the same time encourage the rapid formation of the blood clot.

The class of wounds generally found in this and similar country consisted of trouble caused by stakes, stubs, barbed wire, &c. With regard to stubs in the feet, if they spent five minutes opening out the wound and then poured in a little turps, it would be found that the lameness would disappear in far less time. The ordinary paddock of green feed was a fairly antiseptic place in which to put the patients. A strand of fencing wire made a good probe, and with this one could tell whether any foreign body was inside. A 5 per cent. solution of cocaine applied to the skin around the wound, after it had been scratched with a knife, would assist in controlling the movement of the animal whilst probing or opening out was being done. If an animal had a running wound about the legs the owner could do no harm by endeavoring to find some foreign body.

BARBED WIRE.

Cuts due to barbed wire were best dealt with by first being thoroughly washed. Water should then be kept away from the wound until it healed, or proud flesh was likely to result. Iodine made an excellent dressing. In the majority of cases it was not advisable to sew up the wounds, but if it were so, a bag and not a sewing needle should be used. The general result, however, was to sew in dirty matter, which resulted in the swelling of the part and the breaking of the stitches. The simplest means of preventing the animal biting itself was by the use of a cradle, consisting of a number of rods or sticks extending from its head to its shoulder along the neck. This should be tied to the mane at the top and the bottom. It was necessary to keep an eye on the beast, to see that its general health was good.

QUESTIONS.

In reply to questions, Mr. Place said "Law's Farmers' Veterinary Adviser" was a publication that was well suited to the requirements of the farmer. The best method to stop the bleeding in the case of a colt which had been castrated was to plug the purse with cotton wool or tow with an antiseptic. It would probably continue to drip for some two or three hours. When, however, there was a regular pumping squirt of blood, hot water should be applied over the loins. The knife was better than the searing iron for tailing lambs, as there was less danger from lockjaw. When the bleeding appeared too severe, the application of bluestone would be found satisfactory.

SHEEP AND GRAIN.

Mr. W. L. Brown (Yadnarie) read a paper as follows:—"Every farmer should combine sheep-raising with grain-growing. The first point he has to look to is the carrying capacity of the farm. On no account should he overstock. He should then decide whether mutton or a class of sheep that will grow the most valuable fleece (which I believe is the Merino) is to be his objective. If he thinks a large-framed sheep for mutton will pay him best he should breed one of the long wool crosses, such as the Lincoln-Merino. They are large-framed and good doers, and the lambs mature earlier than the Merino. Wool of this class for several years has been highly favored by wool-buyers. The Merino is the best breeding ewe; the larger the frame the better. They should be mated with a Lincoln ram, which should be well-grown, bold, masculine-looking, robust, and vigorous. The only disadvantage with this cross is that they are troublesome with the fences; but paddocks netted with 4in. x 4in. x 2ft. 6in. sheep netting will be found most effective and as cheap as a six-wire fence. In this district I prefer the lambs to come in June, as the rains are sometimes late, and with them the feed, which makes but slow headway at any time until June or July. As we have not a market for lambs it is not necessary to study that industry at present. Sheep are a great help to the farmer. In the first place they provide meat, which is a very great saving. They also assist in keeping his fallow clean. Sheep as improvers of the soil cannot be too highly esteemed. A sandy stubble paddock on which sheep are turned will retain moisture almost as well as fallow, as the top is kept loosened. With regard to the drafting yards, it is preferable to make these of posts or stakes about 3ft. high, standing perpendicularly and close together, as the sheep neither see through nor get hung up in them. The yard should be on the slope, so that no water lies about in wet weather. The design depends upon the number of sheep kept. When shearing time comes the farmer should provide a cool, well-ventilated but not draughty shed adjoining his drafting yards. At least enough sheep to provide a half-day's work should be under cover in advance, so that the shearers can start at the proper time and are not kept idle, as is often the case owing to the heavy dews we invariably have at that time of the year. The sheep under cover should stand on grating made of timbers set ¾in. apart. This will allow all mud or straw that comes in from the outside yard to fall though, and thus the wool will be cleaner. The get-up of the clip is most important. If a farmer has a large number of bales the fleeces should be skirted, and the skirtings, locks, and bellies put into separate bales. Where there are only 50 or so sheep kept, all that is necessary is to skirt the fleeces of all wet and stained wool. This can be put in with the locks. A small sheepfarmer does not gain by having a large number of parcels. After the bales have been sewn, if the number of the bale, the kind of wool, and the brand are neatly printed on, instead of being scratched on anyhow, it will look nicer and attract attention. Six weeks after shearing the sheep should be dipped. The farmer will then find that his sheep will be free from tick and the fleeces will be in better condition."

Mr. Robertson (Yabmana) and Mr. Abrook (Utera Plains) agreed with the remarks of the writer of the paper.

Mr. W. E. Hier (Utera Plains) thought farmers were well advised to go in for sheep in this district. He favored the Merino crossed with the Shropshire.

Mr. Wheeler (Elbow Hill) thought it a mistake to have lambs coming in March or April. If they were dropped later in the year, say in the spring, the ewes would have a better chance of caring for the lambs, as there was good feed available. Overstocking was to be guarded against.

FREE PARLIAMENT.

THE ADVISORY BOARD OF AGRICULTURE.

At the instance of Mr. T. A. Wilson (Miltalie), seconded by Mr. R. Robertson (Roberts and Verran), the following resolution was carried :—" That this Conference is of the opinion that Branches should have a voice in the election of members of the Advisory Board of Agriculture."

NEXT CONFERENCE.

It was decided that the next Conference should be held at Cleve, the Roberts and Verran Branch undertaking the arrangements.

Evening Session.

PLOUGH OR CULTIVATOR.

The following paper was read by Mr. I. R. Hill, of the Miltalie Branch :—" The preparation of the soil for seeding means the renovation of the land for the growth of corn and other exhaustive crops. This involves freeing the land from weeds and the restoration of its fertility by atmospheric agencies as well as direct manuring. There are various implements for working the fallow and preparing the land for seeding. Up to the present time in this district very little preparation has been done; in fact, the only implement used is the plough. In many cases the same implement is used for ploughing and working the fallow. The farmer who wishes to reap a good harvest must prepare the soil for the reception of the seed, as he now prepares his seed for the soil, knowing full well that it is the land that has received the best preparation that is the most reliable in good or bad seasons. The work should begin the year prior to that in which the seed is sown. Farmers hold different views as to the most suitable way to work their fallow land after it has been ploughed. Some contend that the better way is to go over the soil with the skim plough, and turn all weeds under. This does not commend itself to me. It may be advantageous to plough back the fallow in the very wet districts, but in a district such as ours, where the moisture in the soil should be jealously guarded, farmers will find that the use of the cultivator and harrows will be far more profitable. As to the quantity of rain needed for the production of a payable crop, some valuable information has been gathered during the (1911) harvest from results obtained on experimental plots in the southern districts of New South Wales. Generally farmers contend that from 10in. to 12in. are essential during the growing season. That good crops can be grown with a far less rainfall than that has been clearly demonstrated. At Wyalong the total rainfall from the time the seed was sown until the crop was harvested was 6·68in. The average yield from a 10-acre plot was 24bush. per acre. At Jindera (Albury), with a rainfall of 7·52in., an average yield of 22½bush. was obtained, and Federation returned as high as 28bush. 56lbs. per acre. More remarkable still are the results from the Deniliquin plots, which were sown on May 1st and 2nd. In this case the total rainfall amounted to only 3·22in.—a yield of 14bush. per acre resulted. In each of these instances the land was fallowed and worked with the cultivator and harrows to leave a loose, dry mulch on the surface. A large amount of the previous year's rainfall was thus stored and conserved in the soil; so practically the fall of two years was employed in the production of one crop. Surely such results should leave no further doubt in any farmer's mind as to the necessity for thoroughly working his fallow land."

DISCUSSION.

Mr. W. E. Hier (Utera Plains) thought the plough should be followed by the cultivation of the surface of the land. The use of the plough again for this purpose would result in the loss of moisture, but the use of the scarifier had an opposite effect. The skim plough was very suitable for ploughing in weeds, but on land that was inclined to drift, a tyne implement was better.

Mr. Abrook (Utera Plains) said that if the principles recommended by the writer were applied in his locality there was every likelihood of the land blowing away. Land of this nature was better ploughed and left rough.

Mr. Alm was well satisfied with the work being done by the cultivator on the fallow.

Mr. G. Storey (Yabmana) preferred harrowing the ground after ploughing, and then using the cultivator if thought desirable. If they fallowed early, cultivation would be necessary two or three times to kill the roots. As a result the land became very hard, and in some instances another ploughing would be necessary.

DAIRYING.

The Government Dairy Expert (Mr. P. H. Suter) delivered an interesting and instructive address on "Different Phases of the Dairying Industry," illustrating his remarks with lantern slides.

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CONFERENCE OF PINNAROO DISTRICT.

The Annual Conference of Branches of Agricultural Bureau situated in the Pinnaroo district was held at the Institute, Pinnaroo, on August 14th. The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), Professor Perkins (Principal of the Agricultural College, Roseworthy), Messrs. Colebatch, B.Sc., M.R.C.V.S. (Superintendent of Agriculture in the South-East), F. E. Place, B.Sc., M.R.C.V.S. (Government Veterinary Lecturer), D. F. Laurie (Poultry Expert), G. R. Laffer (Chairman), F. Coleman, C. E. Birks, and G. G. Nicholls (Secretary Advisory Board), attended, in addition to the following delegates :—Parilla—H. E. Johnson, A. J. Stevens, M. Shannon, and C. Millstead ; Lameroo—E. J. Trowbridge, E. T. Wray, F. W. Eime, and A. J. A. Koch ; Clanfield—A. Correll, P. Nelson, and H. Milne ; Claypan Bore—J. Gray, E. Colwill, and F. S. Tall ; Parrakie—F. J. Dayman, R. E. Jose, R. L. Beddome, and M. J. Cooney ; Geranium—W. Mitchell and R. Jacob ; Hooper—J. R. Beck ; Borrika—J. H. Gray ; Wilkawatt—D. F. and W. J. Bowman, J. Ivett, and W. J. Tylor ; Parilla Well—J. W. Johnston, J. Ferguson, A. Webster, A. Foreman, and L. G. Neville (Assistant Hon. Sec.) ; Pinnaroo—F. H. Edwards, H. Ledger, J. Scales, E. H. Parsons, P. J. Edwards (Chairman), P. H. Jones (Hon. Sec.).

A large number of Bureau members and visitors also attended each session.

The Chairman (Mr. P. J. Edwards) extended a hearty welcome to delegates and visitors. He expressed appreciation that the Hon. Minister had found time to leave the stress of Parliamentary duties, to attend and open the Conference, and called on him to address the gathering.

MINISTER'S OPENING ADDRESS.

The Hon. T. Pascoe expressed great pleasure at being present. Such gatherings as this constituted some of the purple patches in Ministerial experience. It was especially pleasing to him to attend the Agricultural Conferences, because, after all, he was more of a farmer than a politician, and his sympathy went out to the farming community above all others. They fully recognised the value of their industry to the State, and how much the country was dependent upon it. It was a curious fact that people in the city apparently felt the effects of hard times much more quickly and acutely than the agriculturists themselves. He believed that this season the more recently settled districts, such as this, were really better off than those north of Adelaide, generally regarded as absolutely safe. Except in one or two very favored places in the latter areas they would not find anything like the feed and crops indicated by the samples exhibited that morning. The fact that the mallee districts were not so badly off as many others was particularly gratifying, because in them so much depended upon the first two or three seasons. If these should prove to be poor, there was a great danger of throwing the country back probably for years, and disheartening the new settlers. Perhaps the most stimulating features of the Pinnaroo and Brown's Well country were the enthusiasm and the energy which the farmers were putting into the Agricultural Bureau, and the fact that they were willing to teach and learn from each other. Altogether there were 15 Branches in those localities, and they comprised 400 members, who were anxious to bring the latest scientific knowledge to bear upon their work. With such a large percentage of settlers of that calibre, who could but help feeling that absolute success must attend the agricultural industry in the new country.

1889 AND 1912.

It was highly encouraging to review the growth of the primary industries in South Australia as revealed by the statistics for the years 1889 and 1912. In the former the average rainfall over the State was 25·29in. (one of the highest totals on record), and in the latter only 14·39in. (one of the lowest). The area under cereals in 1889 was 2,246,510 acres, and in 1912, 3,001,723, and the areas under bare fallow 591,432 and 1,537,789 acres respectively. Those figures presented striking contrasts. Although the increase in the area under cultivation was not very marked, the fallows showed that there had been a great advance in the nature of the farming. Put in another way, the percentage of bare fallow to the total area cropped had increased from 26·3 to 59·6. He was convinced that in the mallee country the area fallowed each year would advance as the farms were cleared and properly improved. In 1889 the wheat produced amounted to 14,577,358bush., or an average of 7·91, compared with 21,496,216bush. and an average of 10·34 in 1912. Could they desire any stronger evidence than that of the benefits to be derived from and advantages of good agriculture ? In the same period the area devoted to orchards and vineyards had advanced from 26,935 to 61,149 acres, and the quantity of wine manufactured from 762,776galls. to 3,974,838galls. From the figures he had quoted it was obvious that they were making their land yield better results than in the past, even in the seasons of reduced rainfall. That was a fact upon which they might well congratulate themselves, because it strengthened their hopes for the future of the primary industries of the State. Having apologised for the absence of the Director of Agriculture (Professor Lowrie), whose ill health prevented him from leaving his home, and mentioned that he had asked Mr. Colebatch to attend the Conference in his stead, the Minister paid a powerful tribute to the valuable influence of the Agricultural Bureau, and to the officers of his department. He was exceedingly proud of the ability of his experts. The six of them (Professors Lowrie and Perkins, Messrs. Colebatch, Laurie, Quinn, and Place) were on the top rung of the ladder in their particular lines, and he did not think half a dozen men of equal merit could be found in any Agricultural Department in any other State. All the officers were working earnestly, honestly, and harmoniously together with him for the welfare of the State. In conclusion, he declared the Conference open, wished it every success, and hoped it would be merely the forerunner of many others.

STAKED AND FISTULOUS WOUNDS.

The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.;) delivered an address on this subject, in which he said wounds of this nature were generally found in positions where they were likely to cause lameness for a considerable time, such as on the sole and frog, or above the hoof-head, where the ligaments were tender and thick. Fistulous wounds also occurred in parts of the body where the vitality was low or less active than it was in fleshy situations. When a semi-blunt stake penetrated, it almost invariably carried in some outside matter, or some part of the horn, hair, or skin was introduced, thus providing an excellent medium in which germs could breed. The difficulty with wounds in the lower parts of the foot was that they became choked with the dirty matter, and if not treated in the early stages, in a few days developed a running sore, which filled the horny base of the foot. The leg began to swell, and the horse was in danger of death through blood-poisoning. With fistulous wither the damage was done under the skin. Rolling on a stone or mallee root usually caused the trouble. The first symptoms, perhaps, were a flinching or tenderness, but soon a swelling occurred. This continued, and very likely increased, until it was found that the hair disappeared and there was a deadening of the skin, and a breaking out with a flow of matter. What was wanted was drainage at the bottom of the wound. Fistula was not a sort of cancerous growth, but a wound which consisted of pipes that were brought about by the growth and action of germs that were in the wound. After these had destroyed part of the bones in the wither they attacked the muscles lower down. A probe should be pushed gently down these tubes. Burning with spirits of salts and oil of vitriol had been recommended by old writers, and in some cases this treatment had resulted in healing, but in others the oil of vitriol had caused the death of the animals. The best method was to restrain the horse, and open out the pipes which were traced by the probe. There was no need to trouble because a fair amount of blood was lost. The wound could be swabbed with the cotton wool or clean rag. The constant application of water softened the tissue, and enabled the live cells to grow quickly and heal the wound; therefore it was well to flush the wound well with cold water. The hose or some other similar method could be used to irrigate the wound for an hour or so per day. If they preferred drugs they could use them, although they were not necessary. Whenever possible it was advisable to keep the animal at work; otherwise the muscles became stiff, and the blood was not kept so clear. With stubs on the bottom of the foot it was best to make an opening large enough to prevent the wound healing too quickly. A popular treatment was to apply a mixture of cowdung and Stockholm tar. It softened the horn, and would draw well, which, in other words, simply meant an increase of the activity of the germs near the surface, so that instead of burrowing into the hard tissue they increased so fast that they had to come away as matter. If the wound were near the hoof-head, it was necessary to see that no foreign matter was in it. When the stub ran inwards towards the hoof it would often be found that the wound healed very quickly, but a month or so afterwards lameness became very marked, there would be a swelling, and perhaps a breaking out at the heels. If by neglect they got a condition of this kind they had better make an opening low down, because the trouble was burrowing between the bone of the foot and the hard horn on the outside. They could materially reduce the pressure where the horn was in contact with the tender parts by rasping it down until it was very thin. One point that must not be lost sight of was that if the operator removed part of the hoof-head that was responsible for the formation of the new horn he would cause false quarter. To obviate this he should not cut through the horn-head, but cut through the horn.

QUESTIONS.

Mr. J. B. Beck (Hooper) asked what, in the event of it being necessary to draw the matter from the wound, the lecturer would recommend for a poultice.

Mr. Place replied that anything that could be used in quantities was useful. Bran was very frequently recommended. Bread, turnips, &c., when boiled made good material. For drawing the foot, Stockholm tar was better than anything. The chief point to remember was to have an abundance of poulticing material and keep that constantly hot and wet. This was best done by pouring water, at not too high a temperature, on to the poultice from time to time. If the animal could be made to stand in hot water for a while, and if they happened to have a piece of old felt which could be put on the foot, this would be better than poulticing.

SANDY LAND.

Mr. R. Jacob (Geranium) introduced a discussion on the subject of "Sandy Land and its Cultivation." On account of the coarseness of soil particles, he said, sandy land was somewhat weak in capillarity, and was unable to carry as much moisture in suspension as was the case with heavier lands, properly tilled. There was free percolation of moisture downward, and free æration of the soil to be considered in determining the best methods of cultivation. It was a serious mistake to work sandy land in a dry state. It should be worked wet in order to consolidate the soil, form a good seed bed, and improve the moisture-retaining powers. He had found the harrows the best means of packing the soil, while much good would be done by running stock on the land. A feature of sandy land was the lack of humus, which reduced the moisture-retaining capacity. There was also generally a weakness in lime. He ploughed such land fairly deeply for a start, and then packed it thoroughly with the harrows. The aim should be to avoid over-cultivation, at the same time securing a maximum moisture-retaining capacity, the introduction of humus, and addition of lime and stronger fertilisers. Stable manure could not be obtained in sufficient quantities for the treatment of large areas, but was admirable for increasing the supply of humus. Ploughing in green crops was a practical way of making the addition, and the same purpose could be served by feeding down fodders on the land with stock and subsequently ploughing in the droppings of the animals. The Pinnaroo district was fortunate in possessing a clay subsoil close to the surface, and this enabled them to grow a diversity of fodders for green manuring.

Mr. Ledger (Pinnaroo) said the sandy land this season was growing luxuriant crops. His experience was that sand in wet seasons held too much moisture and gave poorer returns compared with drier years. The drifting of the sand was not a serious problem, although objectionable near the homestead. Humus could be added to the soil by ploughing in the straw from the crops. He advised farmers to plough and fallow their sandhills from the first. If there were to be slipshod farming while getting a start, that should be applied to the flats in preference to the sandhills.

Mr. Colebatch said there was a reasonable explanation for sandy soil at Pinnaroo giving better yields in dry seasons than in wet ones. The capillarity was weaker, but the moisture was readily available when the plants most required it. In wet years the fertilisers in the soil had a tendency to leach beyond the reach of the plant roots. When fallowing in June he believed in deep ploughing, providing the soil was firmed up afterwards. In spring ploughing, 3in. ploughing was ample, or a lot of work would be required in consolidating the land for wheat. For firming sandy land the harrows were effective.

Mr. Birks (Advisory Board) related his experiences in the Wandearah district, where the working of sandhills had in some instances set up serious drifts. Some men had left the tops of sandhills untouched when fallowing and had got good yields. Growing fodder crops and feeding off lightly with stock was preferable.

Mr. Tyler (Wilkawatt) had fallowed land at the end of May 4in. deep, and had harrowed in melilotus seed, scattered broadcast. He intended to feed the fodder down and cultivate the remainder in about October.

Mr. L. McCormack (Pinnaroo) considered it a mistake to fallow sandhills at all, and it was bad policy to allow them to remain bare. He suggested growing something on them, and feeding off about March.

Mr. Parsons contended that there was very little sand in the hundred of Pinnaroo, even on the largest hills. Rarely did it exceed a foot, and generally it was only a few inches deep.

Mr. F. Norton (Geranium) believed in growing fodders for stock. He had tried peas, lucerne, and English grasses, which had improved the land for wheat-growing purposes. He referred to the merits of peas, rape, millet, sorghum, and maize, and said that by attention to fodder cultivation, five or six sheep to the acre could be kept and fattened profitably, and at the same time humus added to the soil, and fertility enhanced. They had to grow wheat until they got the land cleared of the mallee, but there was a bigger thing in stock-feeding than was commonly realised. In sowing seeds of English grasses a light rolling afterwards greatly increased the germination percentage.

Mr. Troubridge (Lameroo) said some of the most promising crops were on sandy land that had been fallowed.

Mr. Johnson (Parilla Well) claimed that fallow was not a cause of serious drifting if the land was not worked too much before the summer was over.

Mr. Koch (Lameroo) had found it beneficial after fallowing to cultivate north and south when necessary after rains, so that the ridgings prevented undue drifting over the heavier soil on the flats.

Afternoon Session.

IMPROVEMENT OF STUBBLES.

The Superintendent of Agriculture in the South-East (Mr. W. J. Colebatch, B.Sc., M.R.C.V.S.) delivered an address as follows :—"Both wheat and sheep farmers, and those engaged in pioneer farming in the mallee scrub districts, will recognise the importance of giving some thought to the subject of stubble improvement. The wheat and sheep farmers on ordinary arable holdings will be chiefly interested in that phase of the subject that concerns the production of an increased amount of good sheep feed, whilst the scrub pioneers will be inclined to devote more attention to stubble improvement as a means of increasing the amount of straw and flag with the object of ensuring a good burn.

"However, it will only be during the process of reclamation that settlers in the light sandy mallee areas will view the matter from this point. When once the shoots and roots have been destroyed and the land has been brought under a suitable cropping rotation, they likewise will come to value their stubbles as a source of humus, and as a serviceable protection to the natural and self-sown growth of autumn green feed. Still, at the commencement, they are confronted with a real difficulty when unable to secure a satisfactory stubble burn, for it has come to be recognised that inability to destroy the shoots and roots by means of stubble fires during the first few seasons may mean all the difference between prosperous and unsuccessful settlement. Indeed, so important has the problem become in these districts that the selection of the crop to be grown is often determined by its capacity to yield a good heavy stubble. Nor does it appear that the difficulty may be attributed to faulty methods of cultivation and manuring.

"The experience of farmers who have coped with the difficulty and have successfully cleared their blocks is found to vary according to the nature of the land they have had to work. Those who have been fortunate in the selection of their blocks have had very little difficulty in raising wheat crops thick enough in the plant to carry fire, and they naturally advocate the continued growth of wheat for two or three seasons as the best means of subduing the scrub. Others again, who have been less successful with wheat, advise sowing oats after the first crop, and then bare fallowing. On some of the poorer blocks, however, even oats have been found to fail as a stubble-producing crop, and it has been found necessary to fallow up after the first crop in order to obtain the purpose in view. Under such varying soil and climatic conditions no definite rules can be framed. The best practice must be worked out in each district, and each new settler will do well to profit by the experience of those working under similar circumstances. It cannot be gainsaid, however, that under these necessitous conditions every effort should be made to secure only clean graded seed and manure of the best quality, and to endeavor to get the crop sown well and in good time. Where the rainfall is fairly well assured, as it is on some of the settlements in the desert, I think oats should be preferred to wheat where stubble is a desideratum. They produce a large amount of straw and flag, which burns readily, and, furthermore, they can be sown earlier than wheat without undue risk, provided they be well covered. If sown towards the end of April they will be ready to respond to the first showers, which is a distinct advantage, particularly where stem and leaf are specially sought after. In a late autumn, such as we have just experienced, the opportunity for dry sowing is almost sure to have been availed of; but when it has been allowed to slip past and oats have to be drilled after the wheat is all sown, I think it would be wise to try Cape instead of the Algerian variety. They make better growth in the cold weather, and take less time to mature.

"On the inferior soils in the more humid localities I would suggest rye as a crop likely to develop a good burnable stubble. Of all the cereals it is the one best adapted to poor land, and though the grain yield is inclined to be low, it rarely fails to provide a good supply of straw. The straw is barer of flag and stiffer than oaten, but I have never experienced any difficulty in burning it off.

"In districts where the annual rainfall is 18in. or thereabouts, and where the soil is too poor to produce good stubble, an improvement might be effected by sowing a bushel and a half of field peas per acre on the fallow, the early Dun variety, drilled in pairs of rows with 70lbs. to 100lbs. of standard mineral superphosphate per acre. I find it better to drill in pairs of rows on light land, as this arrangement allows each row additional space to spread over, as well as a more extensive feeding area. If the land has been fallowed in June, it should be let lie in the furrow till the worst of the winter frosts are over, which will usually be about the end of July. Peas are found to do best on an old furrow, and for that reason are commonly sown on the earliest piece of fallow available. The harrows should follow the drill to give a good cover, and the field may then be left till the crop is ready to be fed off. The success that we have had with peas at Kybybolite on poor sandy, sorrel-infested soils makes me think it likely that they would suit some of our mallee scrub farms. They favor light open soils containing plenty of lime, and are fairly hardy provided they are not asked to withstand prolonged winter frosts during the early stages. That they will ultimately find a place in the regular rotation practised over our light lands south of the Murray I have little doubt. On sandy soils under relatively heavy rainfall the nitrates are rapidly washed down into the deeper layers, and I know of no better means of replenishing the land than by periodically cropping it with pease or lucerne. It would be foolish to anticipate any decided improvement in the stubble feed until the wheat-cropping system is made to give place to a rotation that includes one or other or both of these legumes. Their action as nitrogen collectors on the nitrification processes in the soil has been closely studied by Messrs. Lyon and Bizzel at Cornell University. These observers have shown by experiments that, in addition to restoring to the soil a quantity of nitrogen compounds which are available later for other crops, the growth of legumes may also furnish nitrogenous food to other plants growing with them and then influence the nitrification of the soil besides.

"The following table shows the influence of lucerne, peas, and red clover on crops growing up with them :—

Grain Grown Alone.		Grain Grown with Legume.	
Grain.	Percentage of Protein.	Grain.	Percentage of Protein.
Timothy grass	12·75	Lucerne	15·56
Timothy grass	17·19	Red clover	24·56
Oats	11·23	Peas	12·71

"The yield as well as the quality has been shown to improve as the result of association with legumes. In the experiment with oats sown alone and oats sown with peas it was found that the yields on duplicate plots were as under—

Pounds of Hay per Acre.

	Oats Alone.	Oats and Peas.
Plot 1	2,900	3,900
Plot 2	3,750	4,850

"A further series of tables might be prepared from these results to indicate the total increase of proteins per ton of yield, for it is evident from the foregoing that the hay produced on the mixed plot was of greater food value weight for weight. The effect of legumes in increasing nitrification in soils was tested as follows :—The percentage of nitrates in soils that had borne legumes and in those that had not done so was first ascertained. A known quantity of nitrifiable material was then added and the soils were further tested for nitrates at intervals. The rate of nitrification was found to be higher in the infected soils.

"These results are peculiarly interesting to farmers on inferior land, as they enable us to understand how we may best control the nitrogen contents of our soils in districts that must of necessity be burnt off for several successive seasons. In order to help us to a clear understanding of the position it is as well to refresh our memories in regard to the fertilising value of the residual ashes. The following table indicates the percentage of potash, phosphoric acid, and lime in the more important kinds of ash met with on our burnt stubbles—

	Potash.	Phosphoric Acid.	Lime.
Wheat straw	12·16	3·20	6·82
Barley straw	19·32	4·83	7·00
Oat straw	20·60	4·16	8·10
Rye straw	17·36	3·82	9·06
Pea straw	22·00	6·84	39·00
Bean straw	21·26	7·35	21·29
Mallee wood	2·42	·48	40·90
Mallee roots and tops	1·80	·41	44·94
Red gum	5·20	3·20	35·98

"It will be noticed in the first place that all the nitrogen has disappeared during combustion, and that the different ashes vary widely in composition. The cereal stubble ash is several times richer in potash and phosphoric acid than the mallee ash, but the latter contains roughly about five times as much lime. Peas yield practically as much lime in the ash as mallee or red gum, and they are richer in the other two minerals.

"Under the present system of farming that settlers are in most cases compelled by force of circumstances to practise there is a steady drain on the nitrogenous contents of the land as well as the mineral constituents. Where no sheep are kept and ordinary superphosphate is used not an atom of nitrogen is intentionally returned to the land. On the stronger types of soil nitrification may suffice for a number of years to meet the demands of crops, but on the sandy land, which is more liable to suffer from leaching, I cannot but think that a radical change in farm practice will soon be forced upon us. The steady depletion of the soil's store of nitrogen will have to be made good again, and this, I believe, will be most economically accomplished by growing peas on the fallows, sowing lucerne with the crop in the autumn, broadcasting forage crops on the growing cereals at the end of the winter, the establishment of stands of lucerne, and the cultivation of spring-sown fodder plants.

"The ultimate effect of growing forage for sheep and of grazing off the stubbles will be to strengthen the land, sweeten it, make it more retentive of useful moisture, improve the character of the stubble feed, and generally increase the agricultural value of the holdings. The following table of Lawes and Gilbert shows what a small percentage of the fertilising ingredients contained in the food consumed is retained by fattening stock.

Percentage of Nitrogen and Ash Constituents Voided by Livestock.

	Nitrogen.	Minerals.
Fattening cattle	96·1	97·7
" sheep	95·7	96·2
" pigs	85·3	96·0
Milking cows	75·5	89·7
Calf fed on milk	30·7	45·7

"These figures go to show that less than 5 per cent. of the important fertilising ingredients consumed by sheep are absorbed during the period of fattening, the balance being returned to the land in the form of manure. This is a most important fact, and one that should never be lost sight of. On it is based the whole theory of soil improvement through the agency of livestock. The greatest need to-day on all our light mallee soils is organic matter, and in order to make good this deficiency and to commence the task of building up the reserves of fertility, settlers should endeavor to commence growing feed and running a few sheep at the earliest opportunity.

"The ploughing and working of the land in the ordinary course of cereal cropping will lead to its amelioration and tend to improve the natural growth of feed up to a certain point, but no permanent advancement will be made without resort to mixed farming in some form or another. The particular system adopted will, of course, vary with the conditions. What will pay best on the good land at Pinnaroo will probably not be so suitable on some of the light sandy country farther south.

"The cultivation of peas on the fallows has already been referred to at some length, and the practice of sowing 3lbs. or 4lbs. of lucerne seed with the crop at seeding time is thoroughly well understood. It is not always possible to augment the stubble feed to any extent by this means, and in a dry year very little benefit may result from it, but the farther south it is tried the greater the chance of success, and when favorable conditions ensue the improvement is very striking. The broadcasting of French cabbage or chou moellier on the growing crop when it is about 6in. or 8in. high has been tried with considerable success by Mr. S. Schinckel, of the Naracoorte Agricultural Bureau, and a number of others are adopting the same practice. It has been tried with oats, barley, and wheat, but the last-mentioned appears to be the most suitable nurse crop. The system followed is to broadcast about ½lb. of seed mixed with sawdust, or some other such vehicle, and then run over the land with the harrows.

"The laying down of a few acres to lucerne each year near the homestead will help to a conclusion as to the advisability of attempting to seed larger areas with this useful fodder. Where the preliminary experience has been encouraging, steps should be taken to fallow a block of land in preparation for next year. It is better not to make use of a nurse crop even when sown in the autumn. If the season is favorable, and it can be sown safely in April, it will have a chance to get established before the frosts set in, but this is generally such a busy time that the work is apt to be hurried through, and it is therefore better, as a rule, to wait till the frosts are past and get it sown at the end of July or early in August. Drill in from 5lbs. to 8lbs. of seed and 1cwt. of super., and cover lightly by using a brush harrow. Harrow it at the end of the spring, and stock it lightly the first summer. At the end of the winter give it another harrowing, or, if the land will stand it, run over it with the double disc. The crop should then be firmly rooted, and if given a cultivation or harrowing from time to time, and kept well manured, it should give a good account of itself for a number of years.

"The cultivation of spring-sown fodder crops does not necessarily imply the use of the Planet-Jun. during the summer, though a larger measure of success will usually be attained if the crop is horse-hoed at or about the time when the rows become well defined. In our experience at Kybybolite very much better results have been obtained with thousand-headed kale than with either rape or chou moellier. The former suffers severely from aphis and caterpillars, and the latter appears to be much slower in development after being once fed down. Every district, however, should investigate the respective merits of these fodder crops for itself, and having determined them, should use the most suitable as a means of adding humus to the soil and increasing the stock-fattening capacity of the land."

At the close of the address numerous questions were asked and replied to by the lecturer, who said that rape and thousand-headed kale, if they could be grown, would be excellent for them to try. Chou moellier did not recover so well as kale after feeding off, as the sheep would be found to attack the sweet, succulent stem. In moist land they should not incur any danger in mixing the chou moellier with super. At Kybybolite it was sown in rows about 28in. apart, and it was only given one cultivation, *i.e.*, as soon as the rows were to be seen.

Mr. E. T. Wray (Lameroo) had grown a fair amount of kale, but it was attacked by aphis.

Mr. Colebatch remarked that the aphis was not so destructive on kale as was the case with rape. The best treatment was to feed the crop off with a few sheep and allow it to reshoot.

Mr. R. L. Beddome (Parrakie) inquired if there were danger of the plants being destroyed by frost if lucerne were drilled by itself in the early autumn.

Mr. Colebatch thought there was a big risk. If the seed were got in early, however, and the sheep were run over the crop for a couple of days before the cold weather set in it would be hardier. Where they were endeavoring to establish a permanent plot of lucerne it was not advisable to sow with a nurse crop. They could not expect to get a good sward of lucerne and at the same time grow a crop of grain.

Mr. R. Jacobs (Geranium) last year sowed peas on red sandy land, and they were considerably blown about by the wind. Thin sowing, he thought, was not as good as thick sowing.

Mr. H. G. Johnston (Parilla) had come to the conclusion, after experimenting, that it was advisable to sow through every hoe on the drill.

Mr. A. J. A. Koch (Lameroo) inquired whether, in the case of peas for feeding off, sown on sand rises, the sand would in any way detrimentally affect the sheep.

Mr. Colebatch did not think there would be trouble through the sand getting into the stomach of the sheep.

Mr. W. Tyler (Wilkawatt) mentioned that a farmer in the district was drilling lime into the land with the idea of checking the growth of sorrel.

Mr. Colebatch stated that in light sandy land, situated 10 miles east of Mount Gambier, experimental plots had been sown with peas, with the addition of lime, gypsum, &c. On those parts where the lime had been applied there had been practically no sorrel, but there was a heavy growth of this weed where other manures had been applied. The probability was that in a well-drained sandy land there was a likelihood of the lime keeping the sorrel in check, but whether it was economically practicable to add sufficient lime to the soil to keep the weed under was not yet determined. Less than half a ton to the acre would show little effect. However, on light land, where the summer working was likely to cause drift, the sorrel might be of considerable benefit to them.

Mr. F. Norton (Geranium) had found that Cape oats grew very quickly when late sown, say after the wheat was finished. He had also tried oats and peas together, the latter being sown through every drill, and little trouble was experienced with the wind. Lucerne would be very profitable in this district. He had tufts growing in different parts of his property, and these had stood a dry spell last year very well. Autumn sowing of lucerne and English grasses was preferable in this district, because they then became well established before the dry weather came on. At Riverton he had sown lucerne with the wheat on 50 acres. The crop was first reaped, and then the straw was cut for hay. He believed that the sooner they commenced keeping stock and growing forage crops the better. He asked whether it was of advantage to roll peas, and whether this crop would eradicate or prevent the spread of sorrel.

Mr. Colebatch thought that in light land such as they had here, particularly if they wished to harvest the crop, it would be a good idea to roll the peas. He was not prepared to say that peas would eradicate sorrel, but they certainly checked its growth considerably.

POULTRY IN PINNAROO.

The Poultry Expert, in the course of an address on the breeding, feeding, and housing of poultry, remarked that Pinnaroo was one of the best districts in the State for poultry, and it was pleasing to notice that already a first-class up-to-date plant had been erected at Lameroo. It had been amply proved that kale, rape, and lucerne could be well grown in the district, and these fodders were of considerable value for feeding. The time had now come for the farmer to look at the farm fowls from a different point of view from that of former years. The old method was to have a few hundred birds running round, and in spite of the fact that in those days the price of eggs was between 3d. and 4d. per dozen, the proceeds in many cases had been considerable. With the introduction of the fox, however, the turkey industry was almost wiped out, and in many parts it was now very difficult to keep fowls. The plan he recommended was to build a fox-proof yard, about one acre in extent, and inside this erect a good house. In too many places the fowls had to roost in stables, and these became badly infested with poultry tick and other vermin. Good straight saplings were necessary for the yard, and the wire netting should be tied down to a tightly stretched wire buried 6in. below the ground. The netting should be at least 6ft. 6in. above the surface of the ground. Old boxes, palings, and such like material, were not satisfactory for use in building the house. Galvanized iron was best. This was vermin-proof. There should be breeding yards, and yards for the laying hens kept separately. A one-acre yard with a house 40ft. long by 15ft. wide, with the perches set all on the one level, would be sufficient to accommodate 500 hens. The male birds should be kept out of the laying stock. They were unnecessary and only spoilt the eggs. The breeding pens should be built in a continuous row to the following dimensions :—Each house 9ft. long by 5ft. high in front and 4ft. at rear, roof of 5ft. iron ; thus giving a floor space of 9ft. by 4ft. 6in. In front of each house a yard 9ft. wide and 40ft. long should be provided. Each house would provide accommodation for one male bird and 10 hens. In this district, considering the facilities for marketing, they should be able to make from 6s. to 7s. per annum per head from their hens, and the cockerels would practically pay their cost of rearing. From 100 to 500 birds could be kept on practically every farm in the district, but he did not believe in allowing them to run at large over the holdings. That farmers were taking an interest in the business was clear from the fact that in the farmers' class at the Parafield Egg-laying Competitions they had 29 entries. Five years ago it would have been practically impossible to select that number of farmers keeping first-class stock in South Australia. There was a desire amongst farmers in nearly every district to secure better stock.

Food and Feeding.

Wheat was the staple food for fowls, and when they could give them a change to oats it would be found to improve the health and egg-producing capacities, and probably at the same time cheapen the cost of feeding. Oats were rich in protein, and contained more fat than wheat. It was not necessary to go in for the soft feeding of mash, &c. If they adopted the scratching system the feeding would involve little time and trouble. A good layer of straw should be put in the house, and all the grain should be thrown into this scratching litter, and in this the hens would have to work for it. The exercise was an aid to digestion. Kale and lucerne (especially the Arabian variety) made excellent feed. The latter could be given when green, or, when dry, chaffed and steamed.

Marketing Eggs.

There was need for considerable improvement in South Australia with regard to the marketing of eggs. If the merchant could not guarantee that the eggs would turn out in good condition in Victoria or New South Wales, he could not afford to pay the top market prices for them. Infertile eggs only should be sent in. All surplus male birds should be done away with, as the hens would lay from 10 per cent. to 15 per cent. more when these were absent. Further, he felt sure the marketing of infertile eggs only would result in an all-round improvement of 1d. or 1½d. per dozen in the market price. They should not overlook the fact that if a broody hen sat on a fertile egg for only six hours germination took place, and at the end of 10 days this egg became rotten. Dirty eggs were not wanted by the consumer, therefore plenty of straw should be provided in the houses. There was now a good demand for eggs, and last year the average price in Adelaide was 1s. 1d. per dozen wholesale.

Questions.

Mr. E. J. Trowbridge (Lameroo) desired to know whether in-breeding between male and female birds from the same parents was advisable when they were 12 months old.

Mr. Laurie replied that it was good breeding to cross the sire on the daughters when they were two years old, but it was not wise to breed as suggested by the questioner. In-breeding for the purpose of fixing types and characteristics was all right, but it was not advisable to get too close. While it accentuated good points it also accentuated bad ones. In any case they should not breed from hens until they were two seasons old. The result of this would probably be a lack of size and constitution in the progeny. With cockerels, however, the case was different, for a cockerel at 12 months old was a vigorous bird.

Mr. A. J. A. Koch (Lameroo) said the time it took to feed a flock of laying hens night and morning on oats and wheat as recommended by Mr. Laurie only amounted to about 10 minutes daily. Last year from two Leghorn hens and one cockerel he bred 25 birds, which were now laying satisfactorily. From five White Orpington hens and one cockerel he had 34 birds, which were fine table poultry, but were not quite satisfactory in so far as laying was concerned. He was satisfied that if the farmer kept a flock of hens and looked after and fed them well he would derive a good income from them.

Mr. P. J. Edwards (Pinnaroo) had found that the hens would not eat oats readily if they were in the habit of eating wheat.

Mr. Laurie said fowls did not like some varieties of oats, which were very tough and husky.

Mr. Beddome (Parrakie) asked whether fowls would do well if kept enclosed and fed on a grain diet.

Mr. Laurie replied that while they might do all right, they would very likely become stale. There was an insufficiency of mineral and salt in the wheat; oats were better if they were plump; maize was too rich; and in peas fat was practically absent; barley was unsatisfactory—it was too starchy. The hens, however, would do all right on rye. Green feed was essential.

Mr. J. Gray (Claypan Bore) desired to know whether it was necessary to provide meatmeal or charcoal grit wher the fowls were enclosed.

Mr. Laurie said charcoal was a good antiseptic, and it was a good practice to use this. Rabbits were as good as meatmeal when they were available.

Mr. Bowmans (Wilkawatt) asked whether it was advisable to give the soft feed in the morning or evening.

Mr. Laurie mentioned that at the egg-laying competitions the practice was to give a light feed of mash with meatmeal in the morning. However, it could be fed morning or evening. Bran used in mashes should always be scalded.

Mr. J. Gray (Claypan Bore) had enclosed a large area for a yard, and had built a house for the pullets, of which he had about 200. There was a large amount of scrub in the yard. The laying had not been satisfactory, despite the feeding of bran mash in the morning and grain at night and green feed during the day. About one month ago they commenced to lay well, but at present they were only giving about half a dozen eggs daily. Some of the birds had taken to roosting in the mallee.

Mr. Laurie pointed out that hens which were roosting in the scrub would not lay well.

TAKEALL.

This subject was brought forward by Mr. W. J. Trowbridge, of the Lameroo Branch, who pointed out that the disease was due to a fungus which attached itself to the roots of the wheat plant. What chiefly concerned the farmer was the means he was to adopt in eradicating it. From observations, he had found that working the land dry, especially fallow land, was one of the greatest mistakes they could make. It was almost sure to result in the crop being badly affected. Continuous cropping of sandy land also seemed to encourage the trouble. He thought it wise not to put any land under crop for three or more years in succession before allowing it to lie out for a season. After the shoots were destroyed a good covering of natural grass was secured. When fallowing the land for subsequent cropping he got on to it early in June or July, ploughing to the depth most suitable to the nature of the soil being dealt with, which, in the case of his farm, was about 3in. Care should be taken to keep the ground free of weeds during the summer, as these provided a host for the takeall. The growth of crops, such as oats, which were immune to the fungus was advisable. The best preventive measures were early fallowing and keeping the land clean during the summer months, and not cropping for more than three successive years as a maximum.

Mr. Mill (Clanfield) mentioned that silver grass provided a host for the fungus. Oats sown after wheat which had been badly affected had been found to do remarkably well. Crops on strong clay land had been attacked by takeall in the South-East.

Mr. H. Ledger (Pinnaroo) produced three samples of wheat taken from a field of 200 acres. One plant presented a very poor appearance; this had been growing on the strongest soil in the paddock. His experience was that takeall was encouraged by sowing the seed in dry ground. When the wheat germinated immediately, the plant came away healthy, but if germination were delayed through a lack of moisture, the wheat was attacked by the fungus.

Professor Perkins pointed out that the name "takeall" had given rise to a good deal of misconception. There was no doubt that if they put in a crop under poor circumstances they might get malting if the grain was half moist, and patches would present the appearance of being affected by takeall. At the same time there was a distinct disease, which could only be determined by the presence of a specific fungus. When the plant was attacked by the disease, beneath the sheath of the bottom leaf black spots would be found. Possibly certain conditions of the soil favored the development of this. If the ground were relatively loose the disease seemed to be favored. It was most prevalent in the lighter lands. Mildew might be mistaken for it, and eel worms frequently caused conditions that looked like takeall. Oats were generally regarded as immune, but the Board of Agriculture in England had found that they were liable to be attacked in that land. Among the conditions which seemed to favor the disease was the defective preparation of the seed bed. If they kept the fallow clean they reduced the danger, because some host plants might grow on the fallow.

Mr. M. Shannon (Parilla) agreed that takeall was more prevalent in sandy land. Early fallowing when the land was in a wet condition was a good preventive measure. It was also essential to have the land thoroughly clean before ploughing. In some cases the ploughing in of the stubble encouraged the disease.

Mr. F. W. Eime (Lameroo) said takeall was one of the results of hurrying the land under crop three or four years in succession, without giving it proper cultivation. If farmers would go in more for growing and feeding off oats they would have less trouble with the disease. His average yield for the nine years he had been in the district had been 15bush.

Mr. F. Norton (Geranium) had found that if he put in two crops of wheat and then one of oats he had little trouble with the takeall.

Mr. F. Coleman (Advisory Board) indorsed the remarks of Professor Perkins. The samples of wheat exhibited by Mr. Ledger were not affected with takeall. He suggested that the application of lime or wood ashes to patches which were producing poor crops, as in this case, might result in improvement.

Mr. J. Jacobs (Geranium) had tried nitrate of soda on these patches, with very good results.

Evening Session.

FREE PARLIAMENT.

A number of questions were handed to the various experts for reply.

Mr. Colebatch said it was unfortunately necessary to burn stubble under certain conditions, but only in so far as it was necessary to reclaim the land was the practice permissible.

A delegate inquired the reason wheat growing on sandhills in some cases turned yellow. Professor Perkins replied that the yellow color of the wheat was an indication that the land was deficient in nitrates, but there were many causes which would result in the crop being unhealthy in this way. He doubted whether rape sown in spring in this district would do well.

TURNIPS.

Professor Perkins pointed out that in countries where turnips were grown, they were essentially spring crops, and although they could grow good turnips in most parts of the State in the winter, he could not see that as a winter crop they were much good. The trouble with the winter-sown turnips was that they were ready for use generally when there was plenty of feed available, and they ran up to seed as soon as the hot weather set in. If, however, they could grow them in summer, there were very few crops that were more profitable. Rape was better sown in autumn. When they put in this crop at Roseworthy they used about 4lbs. of seed to the acre.

AN EXPERIMENTAL FARM.

The Hon. Minister of Agriculture was asked whether he was in favor of establishing an experimental station for the benefit of the farmers east of the River Murray, to which he replied that there was already a Government farm at Veitch's Well, and while this might not effect to any great extent farmers on this particular line of railway, it was on similar country and under similar conditions (perhaps with a little lighter rainfall) to those existing at Pinnaroo. He did not think it wise to have too many experimental stations. More good could be done, so far as experimental work was concerned, by the conduct by farmers, under the guidance of the departmental officers, of such tests as were being carried out by Messrs. Coleman, of Saddleworth ; Pengilly, of Aldinga ; Griffin, of Hammond; and Pope Bros., of Mount Barker.

RESULTS AT ROSEWORTHY COLLEGE.

Professor A. J. Perkins (Principal of the Agricultural College, Roseworthy) delivered an address, in which he gave much information, gathered as a result of experiments conducted at that institution. The statement had been attributed to him that " the Pinnaroo country would not keep a rabbit." On carefully reading the evidence he gave before the commission which inquired into the advisableness of constructing the railway to open up the district, he found that the only allusion to rabbits was contained in an expression of the hope that if the Forest Department should be given control of the sandhills, so that it might plant them with a view to prevent sand-drift, it should be obliged to surround them with vermin-proof fencing. He had always thought that the country would produce good wheat on the better class of land, and that was the principal bone of contention in those days. He was still as strongly convinced as ever, though, that they would inevitably suffer, not only as individuals, but as a district, if they failed to take certain precautions to prevent the shifting of the sand.

MORE MANURE.

The time was coming when they would recognise the wisdom of applying heavier dressings of phosphatic manures than they were inclined, perhaps, to use now. Comparatively light dressings were all right where the land contained an abundance of phosphoric acid, and they had in mind only the production of grain ; but sooner or later they would go in for grazing live stock, and he believed that there was no more profitable form of live stock in that connection than sheep. To enable them to carry the largest number of sheep at the greatest profit it was essential that the land should be treated in the most satisfactory manner. To ascertain the influence of various dressings of phosphatic manures on the carrying capacity of land he had initiated on the College Farm experiments which had now been in progress for about three years. A block of practically virgin country (so far as the application of artificial fertilisers was concerned) was divided into three-acre paddocks, and in each was laid out three plots - one to be treated as bare fallow, another to carry wheat, and the third to be grassed. There were several of these three-acre blocks. In one case he arranged that throughout no manure should be applied to the land. The next series was to receive ½cwt. of manure, the third 1cwt., the fourth 2cwts., and the fifth 3cwts. Although the investigations had been proceeding for only a short period, already the results had revealed a marked difference, as would be seen by the following table :—

ROTATION—BARE FALLOW, WHEAT, PASTURE (1910-13.)

Super. per Acre.	Produce per Acre.			Grain per Acre.		Sheep per Acre. Pasture 12 Months.	Sheep per Acre. Stubble, Dec. to March.	Gross Return per Acre for Two Years.			Profit per Acre Over no Manure.		
Cwts.	T.	cwts.	lbs.	Bush.	lbs.			£	s.	d.	£	s.	d.
None....	1	2	96	10	26	0·48	1·22	2	9	10		—	
½	1	9	71	17	42	0·63	1·62	3	19	6	1	7	7
1	1	15	64	19	20	0·80	2·03	4	9	3	1	15	3
2	1	16	81	19	44	0·99	2·45	4	16	3	1	18	1
3	1	16	34	19	11	1·03	2·56	4	15	4	1	13	0

In arriving at the financial returns the wheat was valued at 3s. 6d. a bushel, the super. at £4 2s. 6d. per ton, and the sheep were taken at 15s. a head per annum. He emphasized the fact that the full benefit of heavy dressings of superphosphates were not realised until approximately a ton to the acre had been applied. In good years he had had fields carrying four sheep to the acre. He took it that the Pinnaroo land was not good grazing land at first, but he felt convinced that if when sowing their wheat they put on more super. they would gradually cause it to become really good grazing country. In most cases the land was light, and therefore the question of humus was of vital importance. So far they had been utilising the supply which Nature had accumulated in the soil during thousands of years, but by cultivation, and especially bare fallowing, they would ultimately exhaust it, and if they did not keep stock they soon would work the land out. The more care they took to store up humus the better it would be for them and for the crops.

CROPS ON SAND.

Reference had been made by speakers to the effect that the only time to get good crops from sand was after a burn. He had ascertained by experiment that on sand ridges (but not on heavy land) it paid well to apply ½cwt. each of sulphate of potash and nitrate of soda to the acre. He was satisfied that if they adopted that plan their crops would not go yellow. Relatively to the influence of nitrate of soda the appended results were interesting :--

	2cwts. Super, 1cwt. Nitrate, at Seeding.		2cwts. Super. 1cwt. Nitrate, in Spring.		2cwts. Super.		No Manure.	
	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.
1905	36	1	34	26	32	12	25	18
1906	22	27	23	32	20	48	18	30
1907	20	29	19	31	20	48	15	52
1908	33	26	32	34	29	27	25	4
1909	34	45	36	46	28	1	23	32
1910	25	48	23	24	24	53	18	7
1911	21	10	22	11	11	43	12	22
1912	20	14	20	47	20	34	12	2
Means	26	48	26	39	23	33	18	51

FORAGE CROPS.

He was glad to learn that peas did well in the Pinnaroo district, because they were exceedingly useful, both for forage and as a means of improving the fertility of the soil. The trouble with most forage crops was to work them in regularly with the main crops. Wheat was the principal crop of value to the farmers, and anything which interfered with it unduly had to be left. While fully alive to the worth of peas, he had to acknowledge that there was no crop which tended more to dirty the land. They must be fed down either when comparatively green, or permitted to go to seed. It was not necessary to sow peas before wheat. Their fertilising properties were not lost when the rotation was bare fallow, wheat, peas, and then bare fallow again. Peas furnished feed generally when there was no other, and he entirely agreed with those who considered that one could not grow a better crop. Kale was supposed to do well in very heavy ground, and consequently rape should be better suited to that country. If they could be grown in the summer, turnips would be excellent. If they were in difficulties and wanted feed quickly they would be well advised to try white mustard. Nothing grew faster in the winter months, or could be more suitable for stock. Lucerne sown in a crop had much to commend it, and gratifying success had been achieved in that respect at Roseworthy. It was a great advantage to have it growing in their stubbles. He always sowed a certain quantity of seed in the hay crops. Sorghum was an invaluable crop in many ways, but it almost invariably reduced the ensuing grain yield. The following table indicated results recorded at the College :—

	Wheat After Bare Fallow.					Wheat After Sorghum.				
	Total Produce per Acre.			Grain per Acre.		Total Produce per Acre.			Grain per Acre.	
	T.	c.	lbs.	Bush.	lbs.	T.	c.	lbs.	Bush.	lbs.
1906	2	8	100	23	48	2	0	39	18	3
1907	1	8	92	20	31	0	17	22	13	7
1908	2	11	26	32	47	2	9	96	28	17
1909	2	7	61	29	54	2	1	49	20	44
1910	2	5	98	19	49	2	0	44	18	25
1911	1	8	9	14	7	1	3	8	12	38
1912	1	6	32	18	11	1	10	33	20	18
Means	1	19	60	22	44	1	14	74	18	47

The growing of sorghum resolved itself into a matter of sowing it late enough, or of cutting it down as he did at Roseworthy, making ensilage, and trusting to the summer rains to produce a second growth.

CONTINUOUS WHEAT-CROPPING.

Conclusive evidence of the undesirableness of keeping the land continuously under wheat was provided by the results of experiments conducted over a period of five years.

Grain per Acre.

	No Manure.		2cwts. Super.		2cwts. Super. 1cwt. Nitrate of Soda. 1cwt. Sulphate of Potash.	
	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.
1905	15	25	32	12	31	26
1906	4	35	6	49	6	30
1907	4	38	2	11	3	59
1908	Bare fallow		Bare fallow		Bare fallow	
1909	31	55	31	27	35	41

So poor was the third crop in each instance that it was determined to try the effects of one year of bare fallow. They would see what a tremendous difference it had made. Why the grain from the unmanured plot should have exceeded that from the plot dressed with the super. was more than he could say.

QUESTIONS.

In answer to inquiries Professor Perkins said the best plan, when applying nitrate of soda, was to distribute it as a top dressing with a broadcaster. Although weight for weight sulphate of ammonia and nitrate of soda cost the same, the former was the cheaper. At the same time, as there were different grades, it was not so dependable. Nitrate of soda suited light land, and sulphate of ammonia heavy land. On land rich in lime he would use nitrate of soda, and in most countries where the rainfall was heavy, it was applied in spring. In a general way, however, he advised broadcasting it immediately after seeding. Nitrate of lime ought to be better than nitrate of soda as a top dressing, particularly for a district lacking in lime. If it were obtainable at the same price he certainly would prefer it. At the College mustard seed was sown as early as possible in the autumn, at the rate of 3lbs. or 4lbs. to the acre. Even when sown in July it ran away quickly. He used it mostly when he feared a shortage of early feed.

TREE-PLANTING AND EXPERIMENTS.

Mr. F. Coleman (Advisory Board) expressed a desire to impress on the farmers in this district the necessity for tree-planting. There were corners of the holdings which could well be fenced off and devoted to this purpose. The conduct of experimental plots, he pointed out, entailed the separate harvesting of small areas of crop, and whilst this would involve a fair amount of time it would give them the opportunity of securing wheat very suitable for seed purposes. He was of the opinion that a good deal of the land in this district was not strong enough for mustard.

NEXT CONFERENCE.

It was decided that the next Conference should be held at Lameroo.

THANKS.

The gathering closed with votes of thanks to the Minister of Agriculture, officers of the Department, members of the Advisory Board, and the gentlemen responsible for local arrangements.

AGRICULTURAL BUREAU REPORTS.

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Port Broughton	†	12	10	Willowie	220	5	3
Port Elliot	262	20	18	Willunga	262	6	4
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Port Pirie	226	6	4	Wirrabara	222	—	—
Quorn	†	20	—	Wirrega	268	6	4
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* No report received during the month of August † Formal report only received.
‡ Report omitted owing to pressure on space.

ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

October 8th and November 12th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

Amyton, August 12.

(Average annual rainfall, 11·82in.)

Present.—Messrs. T. O'Donoghue (chair), T. Ward, A. J. Phillis, M. Corcoran, W. Gum, H. Gum, and S. Thomas (Hon. Sec.).

Sheep on the Farm.—Mr. T. O'Donoghue read a paper on this subject. Sheep were of considerable value, he said, in keeping down weeds. He preferred the Merino, as they were easily kept within the fences. They yielded better wool, and on the average returned more money per sheep than crossbreds. The difficulty in lamb-raising in this district was to get them fat for freezing. The returns for wool per sheep for the last three years had been—1910, 5s. 10d.; 1911, 5s. 1d.; 1912, 5s. 11d. In three years he had received £187, and had saved about 10s. a week for butcher's meat. The feed consumed by the sheep would have been of no use to other stock, as they only had the run of the paddock after other stock had finished with it.

Carrieton, August 14.

(Average annual rainfall, 12·22in.)

Present.—Messrs. W. E. Radford (chair), F. Kraeger, G. Fuller, G. M. Williams, F. Vater, and J. W. Bock (Hon. Sec.).

Threshing Wheat.—In a paper on this subject, Mr. Kraeger pointed out that owing to the uncertainty of the seasons in the north, and the advisability of storing all fodder that was available, the practice of binding and threshing wheat was to be recommended. He adopted this course last year, cut his crop before it was quite ripe, and after threshing it, mixed the chaff and straw, which made excellent fodder for horses and milch cows. The machine could be worked by a 5-h.p. engine, and would deal with about six to eight bags per hour. Harvesting arrangements might be facilitated by growing varieties of wheat that ripened at different times. Even if the farmers continued to cut portion of their crops for hay, they would gain by binding and threshing 100 acres or so when it was nearly ripe, thus ensuring good feed. There was no loss of grain, the sample was good, and the threshing could be done when the general harvesting was disposed of.

Coomooroo, August 16.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. E. Berriman (chair), J. Brown, R. Brice, G. B. Lillicrapp, E. Brice, L. Avery, W. M. Robertson (Hon. Sec.), and two visitors.

Tree and Shrub-Planting.—Mr. E. D. Kirkland contributed a paper, in which he recommended farmers to make a practice of planting a few trees every year. The area to be planted should be well fenced and the ground fallowed during the year prior to putting in the trees. If there were a firm subsoil or a limestone crust, square holes should be sunk. Small trees and shrubs around the homestead could be protected from small stock by having a piece of rabbit netting supported by three or four stakes placed around them. He had found that trees planted in the autumn did well, but it was necessary to protect them from the frosts during the winter. Sugar gums, sheoaks, tamarisks, pepper trees, blue berry, and boxthorn had done very well on his property. In discussing the subject, Mr. L. Avery mentioned that care should be taken in the selection of the land on which different varieties of trees were planted. Heavy clay soils suited gum trees, whilst pepper trees flourished in lighter soils. He preferred the olive as a hedge plant. Mr. G. B. Lillicrapp pointed out that it was necessary to plant trees where there was a good depth of soil, and Mr. R. Brice advised the utilisation of the corners of paddocks and waste land for this purpose. Mr. Berriman thought the best means of preparing land for trees was to plough it to a good depth a few months before planting. No good was done by planting a tree in a hole in which a tree had previously died.

Davenport, July 17.

(Average annual rainfall, 9in. to 10in.)

Present.—Messrs. Holdsworth (chair), Bice, Bothwell, Roberts, Gosden, Messenger and Lecky (Hon. Sec.).

Railways and Water Conservation.—Mr. Roberts read a short paper on this subject. He expressed the view that it was unwise to construct railways in districts where there was not an assured supply of water, and drew attention to the existence of many natural springs in this district which could be utilised for irrigation purposes if dams were constructed in suitable places.

Hookina, August 12.

(Average annual rainfall, 12in.)

Present.—Messrs. D. Madigan (chair), P. Henschke, H. Huddlestone, J. J. Henschke, P. Murphy, sen., B. Murphy, J. Carn, P. and T. Kelly, C. F. Stone, and two visitors.

Wool-classing.—Mr. J. Henschke delivered an address, in which he advised members to keep their wether, hogget, and ewe wool separate, and also to put the broken fleeces by themselves. Loose dirt and dust should be shaken out of the fleeces, and they should be skirted of dirty wool and locks.

Harvesting.—Mr. P. Kelly preferred the use of the harvester for gathering the crop. Straw should be used in the place of cocky chaff for fodder. The Chairman would cut the crop, thrash it, and stack the straw for fodder.

Disc Cultivator.—Mr. L. Woods read a paper as follows:—"The disc cultivator is the best implement for working the land in this dry district, for it thoroughly pulverises the soil, turns it completely over, and leaves an almost perfect seed bed. It does splendid work in stubble land where the straw would have to be raked before any other implement could be worked, and thus saves a good deal of time. When fallowing, six medium horses will work it easily to a depth of 3in. to 4in. in land that has been worked before." Members agreed that the disc cultivator was a useful implement, but it should not be used for fallowing.

Morchard, July 19.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. A. J. Scriven (chair), W. Toop, W. Keauschner, E. J. Kitto, H. A. Toop, E. D. Kirkland, W. Reichstein, G. Parsons, W. Munro, R. Kitto, H. Laskey, R. Jasper, and B. S. McCallum (Hon. Sec.).

Making Farm Life Attractive.—The Chairman read a paper comparing the conveniences of city life with those of the country, and suggesting means whereby the latter could be made much more attractive. He considered that in many instances a want of thought rather than a consideration of the cost was responsible for the lack of conveniences in farmers' homes. In the city, for instance, it was a great convenience to have the water laid on. On almost every farm water could be laid on to the house, either from the tank by the windmill, or by means of a raised tank connected with a tap in the kitchen. The tank could be filled from the roof of the house and a pipe fixed to take the overflow into the underground tank. Suburban gardens were attractive, but on almost every farm flowers and fruit could be grown. Apricots and peaches did fairly well anywhere in the North. The engine power, with which most farms were equipped, might well be used with a circular saw to cut the wood into reasonable lengths, so that the country housewives might in this respect be as well catered for as those in the city. Frequently an hour or two could be well spared after hay had been chaffed and the engine was in working order to cut a supply of firewood. It was a fine idea to provide a tennis court, or similar attraction, on which the younger members of adjoining holdings could spend time occasionally. Two or three trap and saddle horses, and a buggy, sulky, or masher cart should be kept, to enable the womenfolk to visit the store or the neighbors. Out-of-date implements, ill-fed horses, and harness in disrepair, all contributed to make the farm life unattractive. Stables and chaff sheds should be close together, and there should be a space in front of the mangers to permit of feeding.

Morchard, August 16.

(Average annual rainfall, 11in. to 12in.)

PRESENT.—Messrs. J. Scriven (chair), W. Reichstein, W. Kueschner, H. Kupke, G. Parsons, W. A. Toop, E. D. Kirkland, W. Toop, W. Munro, H. A. Toop, B. S. McCallum (Hon. Sec.), and four visitors.

HOMESTEAD MEETING.—Members inspected the stock, crops, and outbuildings on Mr. W. Toop's farm. The engine and chaffing plant came in for considerable notice on the part of the visitors.

BULK HANDLING OF WHEAT.—A paper on this subject was read, and members agreed that some more economical system of handling wheat should be introduced.

WORKSHOP ON THE FARM.—Mr. W. C. Kuerschner read a paper on this subject. The workshop, he said, was an important requirement on the up-to-date farm. It should be sufficiently large to enable a person to work with comfort, and to hold all the machinery and tools required. The blacksmith's outfit should consist of a blower, an anvil weighing from 80lbs. to 112lbs., tongs, drilling machine, vice, taps and dies, hammers, cold chisels, files. Shoeingsmith's tools might also be added. Continuing, the paper read—" Another corner of the workshop should be occupied by a carpenter's bench, with a tool rack, on which the following would be found useful :—Saws, brace and bits, draw knife, plane, chisels, and a half-round wood rasp, together with a good assortment of nails and screws. A small saddler's repairing outfit will also be found very handy, as breakages in harness are constantly occurring where several teams are at work. A leather punch and a packet of assorted copper rivets will do most of the rough work, but if a man is handy with a needle he might go in for sewing, as it makes a neater job. A few other tools, &c., which should always be found in a workshop are a boot last and a shoemaker's hammer, with a supply of brass sprigs for half-soleing boots and shoes, a soldering iron, snips, stick of solder and spirits of salts, spirit level, and trowel. With a workshop and outfit, such as I have described, a man need never be idle on a wet day, besides saving many pounds in his blacksmith's and carpenter's bill." Messrs. W. Reichstein and H. Kupke agreed with the writer. Mr. H. A. Toop thought collar needles and check for relining collars might well be included. Mr. Scriven would add a hack saw.

Mount Remarkable, August 13.

(Average annual rainfall, 14·43in.)

PRESENT.—Messrs. N. S. Giles, B.Sc. (chair), W. J. Oldland, L. A. Bauer, W. Foot, R. G. Fiebig, J. McIntosh, F. B. Smith, G. Yates, jun., D. H. Clarke, and H. H. Davie (Hon. Sec.).

TIMBER DESTRUCTION.—The Branch decided to take steps to endeavor to preserve the natural timber on Mount Remarkable, and to approach the Government with this idea in view.

LUCERNE.—Mr. Foot recommended mixing 5lbs. to 7lbs. of lucerne seed with ½cwt. of wood ashes, drilling this lightly on an acre of ground.

SILO.—The Secretary said a good, cheap silo, for a small establishment could be made of stout posts in pairs, or stouter posts with two battens each side, having the ends of horizontal slabs pushed down between the pairs, with pieces of tin or plain galvanized iron nailed inside over all the interstices to exclude the air. On top of the final weights straw could be placed as on a shed, thus providing a roof.

Orroroo, July 12.

(Average annual rainfall, 13·42in.)

PRESENT.—Messrs. J. B. McDougall (chair), C. R. Macdonald, E. Turley, S. Hook, J. C. Hagger, E. Langton, J. McNaughton, W. Collins, J. M. Cadzow, J. R. Chapman, T. H. Tapscott, L. R. Cottrell, W. B. Weger, H. Chapman, J. Lang, J. T. Northcott, L. Haynes, A. L. Brice (Hon. Sec.), and two visitors.

THE DRAUGHT HORSE.—A paper was contributed by Mr. J. M. Cadzow. In the early days, he said, draught horses were so scarce that a large number of settlers had to use bullocks for tilling the soil. As the early settlers began to make headway a demand sprang up for draught horses to take the place of bullocks, and the nearest place where they could be procured was Van Diemen's Land. These were a nice stamp of horse, but much smaller than those of the present day. They were extremely active, docile, and intelligent, and possessed fine robust constitutions. As might be expected, they were very expensive. As time went on large numbers of light horses came from New South Wales, the settlers crossed these with the Van Diemen's Land sires, and procured a useful horse. This cross was again mated to a draught sire, a steady improvement taking place. About this time three notable sires were imported—Clyde and Argyle (Clydesdales), and Aggravation (Shire). Clyde was a fine acquisition to the colony, and no horse made a more marked improvement to the draught stock of South Australia. Argyle had a long and useful career; and Aggravation also left a fine class of horse. The colony was by this time (about 50 years ago) progressing rapidly, and the demand for draught horses was keener than ever. When settlers began to spread north, east, and west of Clare, stallions were imported from Victoria, New Zealand, and Scotland. In the last 40 or 50 years breeders had had a fine choice of sires. At the present time the draught stock is superior to the draught stock of most of the agricultural countries of the world. In the early days settlers sometimes took two days to travel a single mare to meet a good stallion; many of these pioneers were illiterate, yet they were keen and competent judges of draught horses. They had a knowledge of the points and defects that the rising generation did not seem to possess. In breeding he advised avoiding the lanky animal, prefering the low-set type with well-balanced width of chest. If end appearances were all right there would be little wrong with the broadside view. The low-set type of horse was invariably the most active. The Shetland pony constituted a perfect model of a draught horse. All users of horses should give them a reasonable amount of care; they were well repaid by so doing.

Orroroo, August 9.

(Average annual rainfall, 13·42in.)

PRESENT.—Messrs. T. H. P. Tapscott, W. W. Collins, J. C. Hagger, S. S. and E. J. Hook, L. B. Cottrell, J. T. Northcott, E. Turley, J. M. Cadzow, J. B. McDougall, K. McLean, J. H. Nutt, C. R. McDonald, L. Haynes, J. McNaughton, J. Lang, J. Dennis, J. H. Brown, A. L. Brice (Hon. Sec.), and 12 visitors.

EXPLOSIVES AND TREE-PLANTING.—Members met at the homestead of Mr. J. B. McDougall to witness a demonstration of the use of explosives in connection with the planting of trees. Holes, 14ft. apart, were dug to a depth of 15in. A hole about 18in. deep was made in the centre of the larger holes, and into this a cartridge was placed, the hole being filled up with earth until about 2in. of the fuse projected. The explosions loosened the earth to a considerable depth. Trees were then planted, and to check the benefit of the practice a few trees were put in holes dug in the ordinary way. The results will be watched with interest by members.

Tarcowie, August 11.

(Average annual rainfall, about 15½in.)

PRESENT.—Messrs. A. Dempster (chair), A. C. Kotz, J. Breuer, J. B. Smith, W. Travers, J. O'Grady, J. Symons, D. Butterick, S. Harding, A. Kotz, J. R G. Thomas, M. McCarthy, C. McCann, W. J. Ninnis, J. Dempster, W. Ninnis, A. Shorowder, D. Murphy, P. Reynolds, T. Ninnis. J. Burgess, M. Murphy (Hon. Sec.).

FALLOW.—Mr. W. S. Bennett read a paper from which the following is taken:—"The claim made by many that deep fallowing will produce heavier crops than shallow fallowing is true only in so far as the succeeding cultivation is thorough. If fallowing is carried out to a depth of 6in. or 7in. it will not produce a heavier crop, unless the cultivation is carried out to almost the same depth. The best time for fallowing is when the soil is moist: not too wet, and above all not dry enough to turn the furrow in clods. Under these conditions, when ploughed 6in. or 7in. deep, and broken down with the harrow and then cultivated to a depth of about 3in. it is likely to make a double layer, fine on top and leaving at the bottom of the furrow spaces which in the dry weather of the summer allow the moisture retained by the fine top surface to evaporate. Although the top surface will be fine as far down as the culvitator has worked, the layer under that to the full depth of the ploughing will probably be made up of small spaces and more or less hardened clods. Ploughing to the depth mentioned must be a better preparation of the soil (where the soil will admit of it) than shallow ploughing, provided it is cultivated to the same depth. No plough will pack the soil so well together, especially at the bottom of the furrow, that the use of the cultivator to get it into a fit state to absorb and retain the maximum of moisture which falls upon it can be dispensed with. The object of deep fallowing is to make more plant food available for the ensuing crop and to retain more moisture. Unless the cultivating is as deep as the ploughing the soil is not pulverised to the full depth, and in the lower layer the plant food is really not made available to the plant. Instead of supplies of moisture being accumulated for the crop to draw on during dry spells an unpulverised and unpacked lower bed allows the supplies to evaporate, and thus forces the crop to rely upon rains coming just when needed. When these fail the crop must necessarily suffer. On the other hand, the system of deep ploughing when thoroughly pulverised must make more plant food readily available, and at the same time retain the maximum moisture with which a crop may safely come over a dry spell without sustaining any injury. If 6in. or 7in. of the soil is prepared so that it retains the maximum of moisture and makes the plant food therein more readily available, it will grow a richer and heavier crop than land which has not the same depth and storage capacity. On the other hand, however, I consider that land which has been ploughed 3in. deep and thoroughly pulpervised will produce quite as good, if not a better crop than land ploughed deeper and not thoroughly pulverised. The whole value of fallowing lies in the thorough pulverisation of the turned furrow; the finer and deeper the land is worked the greater the benefit to the ensuing crop. Of course, where the land that is to be fallowed is clean, if it is only ploughed and broken down with harrows this is a valuable preparation for the crop; but taking the seasons on an average, whether on deep or shallow ploughing, it will pay to thoroughly work the land down. It is not necessary to pack the land in this district. Of course, in fallowing one has to carefully observe the conditions of the land and be guided by circumstances. If the field to be ploughed is very dirty it will not do to plough deep: 2½in. is quite enough. It should be well turned over and broken down with heavy harrows, care being taken not to harrow when the land is wet. This will thoroughly loosen the land and ensure the winter rains starting all the rubbish. A good cultivation following this will make a good seed bed, and result in the land being clean when the crop is sown. In average seasons ploughing should be started as early as possible in June, and should be finished by the beginning of August. The land can then be broken down with the harrows and the cultivator put over it while it is still moist; thus preparing it to retain the moisture of the winter and spring rains. While the harrows are invaluable, they only make a fine top surface, while the cultivator makes a deep bed and also brings any clods to the surface where they can be dealt with. Where possible cultivate land twice. The latter working should be done in the latter part of the spring, and no moisture will be lost through evaporation. The land will then be ready for seeding, and the making of a good seed bed will be an easy matter; beside which the land will be in a better state to retain moisture through any falls of rain which might occur during the summer months. Fallowing simply makes the land more retentive of moisture, cleans it, and makes the plant food more readily available. I would suggest to the farmer who fallows one year and crops the next, that instead of fallowing the usual area at least one small paddock be cultivated and sown to oats or barley, with 80lbs. to 100lbs. of guano super. to the acre; to be fed off by stock, and then at seeding time to be ploughed up and seeded. This will ensure the farmer a double return from that paddock, besides enriching the soil by means of the roots of the crop, droppings of the sheep, and the guano. The amount of feed secured will more than compensate for the seed and super. used. To the farmer who crops his land on the three-year system the same will apply. Instead of leaving all the land for grazing, growing only the grass, wild oats, or the little wheat left behind the harvesters, he could crop it as above-mentioned, fallow the following year, and thus increase the returns besides enriching the land, and so gain a heavier yield from the principal crop. Constant cropping is a drain on the land; fallowing should be made more far-reaching in its effects than making available plant food." In discussing the subject Mr. W. J. Ninnis said he preferred a perfect mould from top to bottom for the retention of plant food. He considered continued cultivation disastrous. The Pekina land did not require deep ploughing. Mr. Symon advocated deep ploughing without the mould boards once in five years. Mr. W. Ninnis found that good work could be done by using the scarifier instead of the cultivator for deep work: it was stronger and broke the bottom better. Land could be cleaned better by cultivating with the scarifier than with the plough. Mr. T. Ninnis preferred to allow the land to remain fallow for two years before cropping. Mr. Dempster thought the price of land too high to allow of this practice being economically adopted. He preferred fallowing with the scarifier.

Warcowie, July 19.

(Average annual rainfall, 12·16in.)

Present.—Messrs. T. Donnellan (chair), Marron, Growden, W. Crossman, Hilder, F. Crossman, E. Jarvis, Telfer, B. Crossman, Feineler (Hon. Sec.), and 25 visitors.

Dairying.—The Dairy Expert, Mr. P. H. Suter, delivered an address on this subject. He advised farmers to carefully select their dairy herd, to pay careful attention to feeding and breeding, and recommended the marketing of milk and cream at frequent intervals. Cleanliness was an important factor, and in this regard, limewater for cleaning cream cans was of considerable value. Members expressed their appreciation of the remarks of the lecturer.

Wepowie, August 12.

(Average annual rainfall, 13in. to 14in.)

Present.—Messrs. J. Rielly (chair), M. M. Irvine, J. E. and C. Pearce. C. Knauerhase G. Roocke, W. T. Heitzel, G. Walker, J. Orrock (Hon. Sec.), and one visitor.

Farm Homestead.—In a paper on the subject of the laying out of the farm homestead, Mr. C. Pearce said the dwelling house should consist of four or five rooms, about 12ft. by 12ft. or 12ft. by 14ft., and be set on rising ground near the centre of the farm. An underground tank, 12ft. by 12ft. by 12ft. should be sunk adjacent to the building, and if this were not sufficiently large for the water caught by the roof a 1,000gall. tank could be set about 3ft. above the ground and connected with the kitchen with a pipe. The stables should be set about 6 chains from the house, facing north, and be about 60ft. long by 20ft. deep, with the mangers set on the lower side. It should consist of iron with pine uprights, giving accommodation for two horses in each stall. There should be a space of about 1ft. between the bottom of the walls and the ground to provide ventilation. A shed capable of holding about 12 tons of hay should be at one end. A good well sunk close to the stables would be found very handy. The blacksmith's shop should be sufficiently large to accommodate a harvester. Mr. Knauerhase thought convenience of position the essential factor in laying out the farm buildings.

Willowie, August 12.

(Average annual rainfall, 11·90in.)

Present.—Messrs. T. Hawke (chair), D. McCallum, J. Stone, L. McCallum, S. C. Greig, A. W. Howard, E. S. Bristow, S. McCallum, A. Gray, F. Richter, A. Wilkins, E. J. Kentish, L. Hughes, W. P. Foulis (Hon. Sec.), and one visitor.

Summer Fallow.—In an address on this subject, Mr. D. McCallum said it was an advantage to do some of the fallowing before seeding. Deep ploughing was advisable. Light friable soil, such as was met with on the local plains, could be worked at any time, and he advised fallowing in summer, the land being well-worked subsequently to keep it free of weeds. Mr. E. J. Kentish thought summer fallowing a good practice, as it encouraged the early germination of oats and weed seeds. Apart from this, it was no improvement on early fallow. Mr. Gray thought that if the land were worked lightly in the summer there would be a fine tilth to turn under. It was not advisable to sow the seed when the land was too wet, but moist sowing was better than dry. Oats would lie in the ground for a number of years and then germinate. Mr. S. McCallum pointed out that the practice of summer fallowing enabled one to deal with a larger area without increasing the horse strength. Deep ploughing was best, whilst shallow ploughing was more satisfactory than the use of the skim plough or scarifier. Mr. S. C. Greig thought it better to work the soil wet. Mr. Hawke mentioned the case of a farmer in this district who cropped half and fallowed half his farm each year, and put the seed in when the soil was moist; whilst the yields were not very heavy, the average was good, and the land was much more easily worked. It was not advisable to summer fallow land that had been left out, as it would turn up lumpy. Mr. J. Stone favored shallow summer fallowing. The land took in the first rains and seeds of weeds germinated early.

Wilmington, August 13.

(Average annual rainfall, 18·26in.)

Present.—Messrs. D. S. George (chair), S. George, Scheibner, Hannagan, Dühring, E. J. Gloede, J., G., and W. Schuppan, McGhee, Hill, Forbes, Scholefield, Benier, Pickering, Zimmermann, Slee, B. Jericho (Hon. Sec.).

Cows, Poultry, and Vegetables.—Mr. Forbes read a paper, from which the following is extracted:—"I am of opinion that a dairy is a profitable investment, some of the advantages being a continual supply of milk, cream, and butter for farm use, which helps to support the household, thereby decreasing the expenditure on food stuffs. A supply of cream or butter available for sale to a factory or a store is without doubt the greatest benefit from a farm dairy, in that it provides the household with cash or provisions and other requirements for their upkeep. The dairy also affords a supply of separated milk, which can be used for the rearing of calves. The milk also serves as a good food for pigs. The dairy herd should be made up of the best possible milking strain procurable at a reasonable price. It is quite common to see a large-framed cow (which, if fat, would do for the butcher) being used as a milch cow, whereas a much smaller cow of better milking qualities, with a smaller food capacity, could be obtained, such as the Jersey. I suggest that each farmer endeavor to gradually work into his farm such types of cows as combine milking qualities with size, and weed out the large unprofitable animals. This, I admit, will take time, but in the end this herd will be giving the highest results. Poultry are a source of revenue to the farm. The amount they return for the little attention bestowed on them is remarkable. They are one of the best paying lines on the farm, and it is a great surprise that poultry-breeding is not more extensively carried on, to the farmer's own decided advantage. I admit that when loose they have a habit of scratching haystacks, &c., but all this inconvenience can be obviated if a large area is wire netted for their exclusive use. This will also enable the poultry to be better kept under observation. The scraggy and ill-conditioned birds should be weeded out. This will allow of a small poultry plant being gradually worked up, consisting of good laying strains, preferably White Leghorns or Black Minorcas. A small area should be set aside on every farm for a vegetable garden. It should be well fenced and supplied with stable manure, and ploughed in as required. It is also advisable, if the garden is to be the success it should, that a permanent supply of water be available. In the absence of reservoir water, wells, bores, or dams should be provided, and water conveyed to the garden as required. The water supply could also be used for stock, &c., thereby serving a double purpose, and so not be a straight out charge on the garden. The most used vegetables, of course, should be grown, such as potatoes, onions, cabbages, cauliflowers, turnips, lettuces, and so on; pumpkins, trombones, marrows, squashes, and piemelons should also receive attention, and if carefully picked when ripe, and placed in a dry airy shed, will keep for some time. The piemelon, in particular, I have known keep for months. It can be utilised for melon pies, jams, and, further, when plentiful, has been used as a fodder for pigs and cows by being chopped into chunks. There is also another vegetable I should like to draw attention to, and that is rape; the value of which is not truly appreciated. It can be sown to provide 'early greens' for the table, even before the earliest cabbages are fit to cut. Moreover, it can be cut three times, and should it grow beyond table use it is a good food for poultry, sheep, and cattle, for, if allowed to grow, will reach a height of 5ft. and more. There is quite a variety of greenfeed to choose from for the dairy herd, such as barley, lucerne, maize, sorghum, thousand-headed kale, mangel wurzel, rape, &c. The advantages of lucerne and barley are too well known to need mention, but I would like to point out the value of maize, which, if grown under good conditions, can be cut at least twice, and in some instances three times. This is a very succulent fodder. With mangel wurzels, both the tops and bottoms are used for food. When the tops are finished, the wurzels can be dug up and placed in a dry shed, and fed to pigs or cows by being sliced up as required. It is wise to experiment with some fodder grasses, such as *Paspalum dilitatum* and *Phalaris commutata*, which are both good plants. the value of which has yet to be determined.

Wirrabara, August 16.

(Average annual rainfall, 18·91in.)

Present.—Messrs. C. H. Curnow (chair), F. Cockington, E. Kavanagh, C. Hollett, C. F. H. Borgas, A. E. Stott, P. J. Curnow, L. S. Cobiac, R. Curtis, W. Bowman, W. Marner, H. and O. Woodlands, P. R. Hoskins, G. Hollett, E. J. Stevens, E. Pitman, A. G. Grant, H. G. Hastings, J. Fitzgerald.

Spraying Fruit Trees.—Mr. R. Curtis dealt with this subject in a short paper, in which he indicated that every gardener must spray if he would have clean fruit. Trees that were not protected from the ravages of fungus diseases, aphides, and other pests could not thrive and bear crops of good fruit. For fungoids and aphides, spraying should be done whilst the trees were dormant, or before much foliage had grown, as the solution used could then be much stronger than would be safe after the leaves had appeared. Aphides got their nourishment by sucking, and must be destroyed by contact with the spray, either by burning or suffocation. Tobacco wash, resin paint, or red oil were good for these troubles. Curl leaf of peach trees was a fungus disease and could be prevented by spraying with Bordeaux mixture as soon as the color could be observed in the flower buds. Arsenate of lead, a good strong solution for the first spraying, should be used for codlin moth when the petals had nearly all fallen. The spraying should be repeated 14 days later, and a third time a month after that. The later varieties of apples should be given a fourth spraying. He always sprayed export apples and pears a week before picking to secure the fruit from the ravages of small grubs, which might be missed in picking and spoil the fruit in transit. In the discussion which followed, some members considered that fruit tree pests were really a blessing, inasmuch as they resulted in good prices for good fruit, and the man who was willing to spray properly at the proper time benefited accordingly. Burgundy mixture was quite effective for curl leaf, was easily mixed, and was cheap.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, August 11.

(Average annual rainfall, 18in. to 19in.)

Present.—Messrs. Burton (chair), Murphy, Ryan, Jacobi, Cox, Joyce, A. Bartrum, Woolford, Curtin (Hon. Sec.), and three visitors.

Cultivating and Manuring Orchards.—The Chairman read a paper, from which the following is taken :—" It is a good plan to plough or cultivate the orchard one way early in the season, to allow of the ground becoming well saturated, and to cross work it at an early date to keep it from setting. As warmer weather appears cultivate occasionally, which causes the weeds to decay in the soil, thus keeping the land in good heart. As the season advances the cultivator should be kept going, especially on warm days. This will soon result in the orchard being perfectly clean, with a nice loose soil, and assist in the retention of moisture. If summer rains fall, cultivate each way. Fruitgrowers should never allow their trees to suffer through lack of proper food. Some soils naturally contain a large amount of plant food, yet this cannot be expected to last for all time. Every crop removes materials in certain proportions, and these should be returned in the shape of manures. An occasional dressing of manure is of great assistance and materially aids in keeping the trees in a good condition. Special manures are also serviceable to make good the shortage in the soil which is caused by exhaustion of lime, potash, and other essential materials. However, the excessive use of manure, while conducing to strong growth and heavy crops, will cause a falling off in the quality of the fruit. Even soils that were originally rich may after a time become more or less exhausted and cease to give satisfactory returns without assistance in the form of manure. The period of the year at which manures are applied has a great deal to do with their value, and the value of a dressing is often reduced through it being applied at the wrong season, or when the soil is too dry to admit of its decomposition and assimilation by the roots. Fruit-forming manures, or such as are given to perfect healthy trees and to ensure good quality fruit, are given in spring or towards summer, according to the time of ripening ; on the other hand, under normal conditions, wood and bud-forming manures are best applied in autumn, before the ground gets cold or soaked with water. Systematic feeding of the roots is desirable in the late summer and autumn, as it keeps the immature buds from ripening by developing and plumping up the shoots. Stable manure and green crops are best ploughed in; nitrogenous and phosphatic manures should be harrowed in. The use of manure means healthy trees and vigorous growth, which develops the power to resist insects and other diseases. If the soil is worn out or deficient in humus, this must be supplied either by the liberal addition of farmyard manure or by the planting and turning under of leguminous crops, which, besides furnishing humus, supply the soil with a certain amount of nitrogen derived from the air. To ensure a good crop of legumes on a worn soil an application of kainit, lime, and phosphoric acid is necessary. Manures, such as potash and phosphates are suitable for application to the trees in the orchard, but as a rule the addition of lime or gypsum will render the addition of potash in any quantity undesirable. Gypsum renders the organic matter in the soil available for plants at once, therefore it must not be applied too freely, or it will cause a percentage to be lost by leaching." Mr. Joyce thought it advisable to apply all manures early in the winter. Mr. Jacobi recommended experiments with various manures.

Belalie North, June 14.

(Average annual rainfall, 16in. to 17in.)

Present.—Messrs. P. J. O'Leary (chair), A. H. Warner, F. Gullidge, D. Smart, D. Fox, T. Dunstone, T. P. Scholz, W. Cummings (Hon. Sec.), and six visitors.

Feeding Farm Horses.—In a paper on this subject Mr. Dunstone described the method he adopted for feeding horses. Chaff and bran were given in the morning, one hour being allowed for feeding; from one and a half to two hours being allowed for the mid-day meal. Long hay was fed last thing at night. Green feed or boiled linseed tended to purify the blood and keep the animals in good health. One pint to one pint and a half of the latter was sufficient for the feed. Regularity in feeding was essential.

Care of Farm Implements.—Mr. A. H. Warner dealt with this subject in a short paper, in which he advised the careful cleaning of dust and oil from implements and machinery before they were put away in the sheds. A good coat of paint had a beneficial effect on the wood and iron work.

Belalie North, July 12.

(Average annual rainfall, 16in. to 17in.)

Present.—Messrs. P. J. O'Leary (chair), A. H. Warner, P. and D. Fox, J. Gullidge, T. Dunstone, T. P. Scholz, and 10 visitors.

Home Life on the Farm.—An interesting paper written by Mrs. W. Cummings was read by Mr. Warner. The writer pointed out that the management of a farm entailed the exercise of considerable tact. Improvements gleaned from the inspection of neighboring holdings, together with the experience of personal experiments, should materially assist in making conditions on the farm more satisfactory. Surrounded as it was by the beauties of nature, the farm life should be the best and brightest of all; but this was not likely to be the case where the farmer thought too much of money-making, or where lack of experience made the burden heavy. The home should be made attractive. Creepers, trees, flower and vegetable gardens should be planted. At intervals of five years the house should be painted and renovated. Entertaining books, music, and similar attractions should be provided. The farmer should give his son an early insight into the whole business of the farm. He should make him a partner in the concern as soon as the boy was old enough to appreciate the relationship. There would then be less inclination on the part of the son to abandon the land for life in the city.

Crystal Brook, June 21.

(Average annual rainfall, 15·62in.)

Present.—Messrs. M. P. Pavy (chair), W. J. Venning, W. Hutchison, G. Davidson, I. Teakle, G. Miell, A. J. L. Wilson, G. Gum, H. and S. Billinghurst, A. E. S. Clarke, G. Sargent, T. L. Kelly, A. E. Cooke, G. A. Solomon, R. Heaslip, J. B. Greig, J. H. Hill, W. W. Lovelock, A. J. Dennis, H. Growden, J. Pridham, M. Weston, A. Macdonald, B. Weston, H. Sutcliffe, W. W. Robinson (Hon. Sec.), and one visitor.

Short Weights in Super. and Twine.—The following paper was read by Mr. R. R. Shaw:—" One of the first principles laid down by business men is to get an equivalent for money expended. Most commodities are sold by weight or measure, or so much for the complete article. The ordinary purchaser going into a store pays for the article he buys at a price mutually agreed upon by the seller and buyer. When a farmer sells the produce of his labor the buyer invariably checks the weight of same and makes pretty sure that he gets the full value of that for which he pays. This being so, the farmer has an equal right to insist upon getting the full value of that for which he pays—but does he ? Taking the first of several articles, *i.e.*, binder twine. This is supposed to be sold by weight, each ball weighing about 5lbs., with 12 balls to the bale, equalling about 60lbs. The weights of these have been checked in scores of cases after being taken to the farm, and have been found 2lbs. to 4lbs. short after the sack or bale is removed. Last season there were 714,766 tons of hay cut in South Australia. Assuming that all, or nearly all, of this was cut by the binder, 23,825 bales of binder twine were used; estimating one ball of twine for 2½ tons of hay. A shortage in weight of 2lbs. on each, which is well within the mark, gives a total of 47,650lbs. at 7d., which the farmers paid for, but did not get. It is futile for the vendor to say that it loses weight by keeping. If such is the case, then an allowance should be made for the shortage on each bale or number of bales. They should be weighed out on delivery and payment made for the actual weight, less the sack enveloping same. Another article used very extensively on the farm is superphosphate. The present system is very unsatisfactory in regard to weights, as, unless a farmer gets his consignment separately with a guarantee of weight, he is not sure of what he is getting. Where farmers have checked the weights of a few bags and found them short, the agents have assured them that if a few bags are short weight there are others overweight, which will make up for the deficiency. A farmer in this district weighed a few bags of his consignment and found that if they all were the same weight he would have had half a ton short delivered. It seems just as reasonable for the agent to take the farmer's word for the weight of his load of wheat as for the farmers to take the agent's word for the weight of the super. he delivers. Super. should be weighed out upon delivery, the same as any other commodity, and for preference over a public weighbridge, which should be installed at every railway station which is the outlet for big wheat-producing districts. Another matter that I should like to draw attention to is the general dissatisfaction expressed by those who send eggs and poultry to the Adelaide salesmen. The preponderance of evidence and experience of those engaged in this business is that, in the case of eggs, there is far too much docking for breakages; in several cases there has been amounts knocked off the account sales for broken eggs when it has been known that the packages were exported to the other States without being opened or examined. I do not impute dishonesty, I put it down to slack business methods on the part of the vendors, and apathy on the part of the farmers for not taking concerted action to get matters rectified. In the case of super., the vendor has to submit a sample for analysis from bulk. This is published for the benefit of the purchasers, and this standard has to be maintained or the vendor is liable under the Fertilisers Act. This Act should be amended by requiring the addition of a guaranteed weight in each bag. The same argument applies to binder twine and all other articles used extensively on the farm, as the narrow margin between profit and loss in growing wheat alone demands that there should not be any leakage in short weights." In discussing the subject, Mr. M. Weston said that wrappers were purchased as binder twine, in the same manner as bags were sold as wheat. No trouble would be experienced with short weight in colonial-made or re-bagged super. Mr. Clarke said short weight in most cases was due to evaporation, but in the case of binder twine the decrease in weight was concurrent with an increase in length. Super. weights were generally correct if there were no leakage. Mr. Heaslip pointed out that whilst the wrapper on binder twine was practically useless, wheat sacks could be sold at good prices secondhand. The tare of railway trucks was unreliable, as they frequently contained a quantity of sulphide, &c., and the weather conditions caused variations. Mr. Munday had noticed a variation of 10lbs. in the weight of super. Mr. Venning thought twine and super. should be weighed on delivery by the agents. He had found as much as 10lbs. short weight in a bag of super. and 3lbs. or 4lbs. in a bale of twine. Mr. Sutcliffe thought eggs and fruit should be graded and open to view in the markets. Mr. Hill had found a variation of weight in the individual bags in a line of super., but the total weight was correct. Mr. Solomon read correspondence from the manufacturers with regard to the practice in operation at their various works for weighing the super. for delivery. It was weighed in the bags on an automatic Avery scale, 4½lbs. overweight being put into each bag as allowance for the bag and shrinkage, the actual gross weight of each being just over 191lbs During the course of the day the weights of individual bags were continually checked on a platform Avery scale, and in most instances it was found that the automatic scale was slightly in excess, this, no doubt, being due to the automatic cut off not being sensitive enough. In no instance had they found the automatic weigher under weight. The correct weight was in the bags when they left the works. Any loss was, no doubt, due to rough handling when the fine super. would pass out through the pores of the bags, and to shrinkage. In the case of super. bagged late in December, which no doubt contained 10 per cent. of moisture, and delivered to outports, the hot weather most likely caused a loss of weight by shrinkage. As this shrinkage went on through loss of moisture, so the phosphoric acid contents increased, and although the weight might not be in the bag the grade of the material contained therein would be higher. Thus the farmer was compensated for the loss in weight, for he was obtaining a much higher grade manure than he was guaranteed. Super. bagged at the works and containing 10 per cent. moisture and 37 per cent. water soluble tricalcic phosphate might be delivered and held in store for, say, three months during hot weather. At the end of this time, if an analysis were made, it would be found to contain, say, 4 per cent. moisture, but the water soluble tricalcic phosphate would be 39·4 per cent., as against 37 per cent., and the bag would be found to have lost through shrinkage 11·46lbs., equivalent to 137½lbs., per ton. Thus, while the weight might have decreased through shrinkage the grade of manure had considerably improved.

Mount Bryan, August 11.

(Average annual rainfall, 15·81in.)

Present.—Messrs. Trallagan (chair), Wardle, Hatherly, Phillips, Jefferies, Nutt, and Hatherley (Hon. Sec.).

Poultry —In a short paper on this subject Mr. Phillips said that for the profitable production of eggs regular feeding was essential. He had found the Brown Leghorn a good fowl for egg production and table purposes; whilst it was not equal to the White Leghorn for laying purposes it was much better for the table and produced more eggs than the Wyandottes. They kept in good condition and stood the cold winter experienced in this district well. The practice he adopted was to change the breeding stock every year, procuring eggs from proved strains, rearing chicks the following year from two-year-old hens crossed with one-year-old male birds. The business could not be profitably carried on unless good reliable stock were kept.

Port Germein, August 9.

(Average annual rainfall, 12·84in.)

Present.—Messrs. Hackett (chair), Holman, Carmichael, Teasdale, Stone, Deer, Hillam, Glasson, Head, McDougall, Crittenden, and Stewart (Hon. Sec.).

Poultry on the Farm.—Mr. H. Crittenden read a paper, in which he said, "The average farmer has a lot to think about, and in the majority of cases he views his poultry as a matter of little importance. In the first place he gets a few fowls to provide sufficient eggs for use on the farm and a bird occasionally for the table. He is generally fairly particular in his selection for a start, but, of course, he has only a few fowls and allows them to roost on a tree close by, because it would not pay to put up a house for them, or he has not the time. These fowls do very well. They have come to a new place, and they have all that nature demands. In some out-of-the-way corner they bring out their chicks. This continues for years and the farmer finds that he has done well by buying those few fowls. They have become a big flock, and they have kept him in eggs, and he has sold hundreds of dozens. But at last disease sets in and he finds them dying fast. After the disease has taken about half of them he finds those left are a miserable lot, and are falling off in their egg production. Compare his 30 fowls with 30 fowls 12 months old kept in the correct way, and what do we find? Just this: that these fowls are laying about 25 eggs per day and bringing in a good return for their food. The farmer has done wrong in many ways. He took the fowls on new country in the first place, and they did well, because there was plenty of natural herbage. This he has neglected to keep up. He has cleared away all the surrounding trees which gave his poultry shelter, and left them to, perhaps, the dry limbs of a dead tree. He has allowed his stock to breed in year after year. Perhaps he is left with a lot of the old hens. This is simply because he has neglected his yard. He says they do not pay to look after. He should go to his starting point again, sell out all his old stock, select a new lot, and keep young healthy birds, and they will repay any work that he puts into them." Mr. Hillam agreed that the breeding of poultry should be carefully controlled by the farmer. Mr. Hackett considered lice and tick the source of considerable trouble with the fowls.

Port Pirie, August 2.

(Average annual rainfall, 13·21in.)

PRESENT.—Messrs. J. Greig (chair), W. Munday, T. Johns, F. Johns, W. R. Wright, T. Kirchner, A. Bond, and A. M. Lawrie (Hon. Sec.).

HARVESTER *v.* STRIPPER.—In a short paper on this subject, Mr. F. Johns said the harvester should be driven by a person who had a direct interest in the crop being taken off, as, unless every care and attention were paid to the machine, a dirty sample would be secured, and grain would be lost over the tail piece. For the person who was cropping a fairly large area it would be found better to have one stripper in addition to the harvester. It was essential for him to keep a winnower for the purpose of cleaning the seed wheat, and the stripper could be used for reaping any particular variety of wheat being grown from which the best cocky chaff could be secured. The harvester worked best on level land where the speed of the machinery was maintained, but the stripper could be used on sandy rises and in such places where the use of the harvester was not advisable. Mr. Kirchner favored the use of the harvester, on account of the saving of labor which it effected. Mr. Munday thought the stripper would be more used in future, as the cocky chaff saved was coming to be recognised as a valuable standby. However, the harvester did good work in a heavy crop and any wheat that had gone down or was tangled, but oats and lighter weed seeds were distributed by means of this machine. ' Messrs. T. Johns and Wright preferred the harvester, but the Secretary advised the use of the stripper on rough stony land.

Redhill, August 26.

(Average annual rainfall, 16·79in.)

PRESENT.—Messrs. W. Pengilly (chair), D. and E. Steele, F. and F. A. Wheaton, Kelly, Stone, McAvaney, Potts, G. Button, P. H. Wheaton, Treloar, Holmes, Coffey, A. Dick, J. J. and W. Haynes (Hon. Sec.), and seven visitors.

HOMESTEAD MEETING.—The homestead of Mr. M. M. Coffey was visited. This constituted one of the best improved farms in the district. The convenient laying out of the stables and outbuildings was much admired. The crops were looking well, considering the season, and the experimental plots provided a matter of interest. A harrows-sulky, so affixed as to slide from one side to the other as the horses turned the corners, and which was designed by Mr. Coffey, was thought very useful.

NORTHERN BRANCHES CONFERENCE.—Mr. E. Steele presented a report of the proceedings of the Conference of Branches held at Saddleworth. Mr. F. A. Wheaton agreed with the remarks of Professor Lowrie with regard to the breeding of lambs. Mr. Stone preferred the first cross, and some members thought it would be necessary to resort to the second cross for fat lambs. Mr. D. Steele favored the Lincoln, and had bred to the third cross, and secured good lambs. Mr. Pengilly considered the Shropshire cross the best shaped lamb. Good feed was essential.

Spalding, August 15.

(Average annual rainfall, 20·25in.)

PRESENT.—Messrs. E. E. Gill (chair), Jones, Pluckrose, Ryan, McLeod, T. J. Preiss, J. Preiss, A. Howley, P. A. Gill, Sanders, S. Hennessy, G. Page, Work, Marrow, D. A. Campbell (Hon. Sec.), and three visitors.

VALUE OF LIME IN AGRICULTURE.—The following paper was read by Mr. A. B. Jones:—"The study of this subject is now occupying the attention of scientific investigators and practical agriculturists in different parts of the world. Until now the data available from experiments carried out under Australian conditions has been very limited, but, as the results of very complete field tests now being undertaken by the Victorian Agricultural Department become known, they will probably create an interest among farmers and provide a working hypothesis from which to commence operations. With my limited experience in these parts I cannot express an opinion on the likely need, value, or effects of lime, and, as previously remarked at these meetings, 'no hard and fast rule can be laid down for the district,' indeed, I will go further and say 'no hard and fast rule can be laid down for any particular farm.' Just as a few years ago the value of superphosphate was practically unknown to the agricultural community, so to-day lime stands in that position; although, paradoxically, lime was probably the first of the mineral substances applied as a dressing to the soil, and I venture to think that in a few years' time, and as the result of experiments now being undertaken, that an application of lime to the paddocks will come to be recognised as imperative as an application of superphosphate. On some of the private-owned railroads of America, and on the public railways of New Zealand, lime is carried at a loss, thus showing that its value is recognised in increased production. The soils of Australia, taken in general, are deficient in lime—the average percentage of inland soils reaching somewhere about 9,000lbs. per acre, about half the quantity considered by Prof. Hilgard (a noted American authority) to be necessary for a fully productive soil. Lime, although one of the principal essential elements of soil fertility, is not usually regarded as a manure—the value of its addition to the land is generally considered in a chemical, physical, or bacteriological sense. Its chemical effect is to assist in liberating the plant food contained in certain insoluble compounds in the soil, and the 'sweetening' of land that has become acid or 'sour' from the continued use of phosphate in the form of superphosphate. The physical effect is most marked by its action on heavy clay lands—the addition of lime to these soils renders them more friable and porous, thereby assisting ærration, gives them power to absorb and conserve more moisture, and facilitates the working and cultivation of that class of soil. Lime greatly assists in the decomposition of organic matter applied to the soil or naturally present therein, and thus is of great value in supplying humus—probably the most valuable soil constituent. As the result of elaborate experiments carried out at the Iowa Experimental Station the addition of lime was found to have a very beneficial effect in increasing the number of bacteria present in the soil; and the conclusions arrived at were, 'that the application of lime to soils will render more available the plant foods in soils and fertilisers, thereby improving crop conditions, and that an application of lime is practically equivalent to the direct use of nitrogen, phosphoric acid, and potash.' These results are equally applicable to the soils of Australia—whether or not the practice will be found payable on any particular farm in this district I leave to the owner of that farm to find out by experiment. The value of a heavy dressing of marl (a form of lime) given to certain paddocks at the Rothamstead Experiment Station, England, more than a century ago is still evidenced by their productive capacity compared with adjoining paddocks not so treated. How are we to know when our land requires liming ? There are certain simple tests that can be made, but the results are not an infallible guide. One method of testing is to procure a small quantity of soil and treat it with hydrochloric acid, *i.e.*, spirits of salts. If an effervescence occurs it will reveal the presence of lime; no action taking place will probably mean a deficiency. One may often detect a deficiency of lime by the growth of certain kinds of vegetation, such as sorrel—this and certain other weeds will flourish in a sour soil. The strong growth of clover will usually denote a sufficiency of lime; and it may here be remarked that lucerne and other leguminous plants require large quantities of lime to be present in the soil for their development. Calcium oxide, which is the chemical name for lime, is found under various names, such as limestone, marl, quicklime, slaked lime, gypsum, &c.; which of these is most profitable for use depends mainly on proximity to limestone deposits. All these forms are not of the same value for agricultural purposes. For instance, one ton of quicklime will contain one and three-quarters times as much pure lime as that weight of ground limestone, and three times as much as one ton of gypsum. Certain of the commercial fertilisers on the market contain a fair proportion of lime—phosphatic guano containing about 40 per cent. and Thomas' phosphate 20 per cent. pure lime. The lime in these cases is procured for practically nothing. I might mention that lime in the form of gypsum is of no value if intended for the purpose of sweetening sour land, as it is already in combination with an acid, and therefore will not unite with and neutralise the acids of the soil. Quicklime is the most useful form for decomposing organic matter to form humus. There are different systems employed for dressing the land—one method is by distribution by means of the ordinary drill. This, of course, demands that the lime should be in a finely pulverised form, and only limited quantities can be applied at the one operation. A handy attachment can be made for working at the rear of a cart or wagon, and this will allow of heavy dressings. Special machines may be purchased for the work, and I believe they may be purchased up to 10ft. in width, so should greatly facilitate the operation. The dressing should be given to the fallows some time previous to seeding, except in the case of ground limestone, which may be applied at any time. I might add that lime should always be applied to the surface and harrowed or lightly scarified in—not ploughed in, as it has a tendency to sink in the soil and be carried off in the drainage waters. Heavy dressings, as much as 3 tons per acre, are beneficial to very heavy soils rich in organic matter, and the old custom in other countries has been to make heavy applications at long intervals. The present day idea is smaller dressings at shorter intervals; and again I must state that the quantity, if any, that can be profitably made use of can only be ascertained by actual and careful experiment, and it must always be used in a regular system of manuring with phosphates and the addition of organic matter. There are certain precautions to be observed when using lime for agricultural purposes. I have previously stated that it supplies humus by the decomposition of organic matter, and it is equally true that it is a robber of that vital necessity; therefore, as I have just stated, on most soils, with the generous use of lime, some system of supplying humus is imperative. I again repeat that line will not dispense with the use of phosphates. Although most people will admit the efficacy of a dressing of lime they will probably object to it on the score of cost and labor; but in these times of high land values it is essential that we should make the very best use of limited areas, and if the addition of lime to the usual course of a dressing of phosphate is going to prove profitable it will be to the advantage of farmers to make use of this element to assist them in maintaining the fertility of their land and securing higher yields."

Whyte-Yarcowie, July 21.

(Average annual rainfall, 13·91in.)

Present.—Messrs. G. F. Jenkins (chair), McGregor, McLeod, Wittwer, J. Walsh, F. Hunt, F. Pearce, J. R. Mudge, C. Siebert, G. D. and W. Mudge, F. H. Lock, E. J. Pearce (Hon. Sec.), and two visitors.

Bulk Handling of Grain.—In discussing the subject matter of the paper read by Mr. Lock at the June meeting (printed on page 1423 of the July issue), Mr. McGregor said that whilst there was a great lack of disinterested information on this subject, he believed the bulk system of handling grain would be an improvement. Mr. Lock read an extract from the report of the Royal Commission on the Marketing of Wheat, which showed that the elevators in Canada were largely owned by the railway companies. That the cost of an elevator in America was about 2½d. per bushel of capacity, and that there were sometimes as many as six elevators in one railway yard. Some small ones were of 20,000bush. capacity. The only shipment of bulk wheat from Australia he had experience of was one of 1,500 tons from Sydney. This was discharged into elevators at Liverpool, and was from every point of view satisfactory. Some half a dozen of the leading millers in England thought so highly of the elevator system that they had erected elevators at their mills, and even had suitable railway wagons constructed to rail their own grain on company-owned railways. He thought it was quite time the matter was taken up in Australia. Mr. Wittwer was of opinion that the chief difficulty at the outset in introducing the system would be in dealing with the wheat on the farms. How were they going to manage in the harvest-field? They were always anxious to remove the crop in the shortest time possible, and a farmer could not always have the plant and labor necessary to carry the wheat off the field as fast as it was reaped. The Hon. Secretary read a short extract from a New South Wales paper, which showed that the mother State was alive to the advisability of substituting a more up-to-date method of handling grain for the one now in use. An expert had been brought from America and had been over all the railways of the State, and was conferring with the Railways Commissioner with a view to introducing the system. This expert was satisfied that the introduction of the bulk system would mean a great saving to both producer and consumer. The speaker was satisfied that the system was a superior one, and although, perhaps, for a time, in most cases farmers would still use cornsacks for transport purposes to the elevators, 100 sacks would suffice where now 1,000 were required, and these could be of superior quality. The Chairman thought this State was handicapped to a considerable extent by the scattered nature of the agricultural areas and the number of ports at which wheat was shipped. However, he would like to see the matter taken up by the farmers and thoroughly thrashed out. Mr. Lock, in replying, said that if this matter, which was undoubtedly in the air, was to materialise, the farmers themselves must take the initiative; it was to their advantage, and they would probably find that they were up against strong interests that were vested in the present system.

Yongala Vale,

(Average annual rainfall, 13in. to 14in.)

Present.—Messrs. T. Keatley (chair), J. Lloyde, W. Laubsch, F. Miller, E. Cooper W. Edson, A. Jamieson, sen., B. Webb, G. Lloyde, J. Barker, G. Keatley, G. I'Anson, G. Battersby, C. Fowler (Acting Hon. Sec.) and two visitors.

Fallowing.—In a short paper on this subject, Mr. W. Laubsch said stubble should be burnt as soon as possible, and the ground broken with the cultivator; providing there was a fall of rain ploughing should be done early, and harrows should follow the plough to encourage a growth of weeds. The land should be cultivated once before or during hay-making, and, in the event of heavy rain, during harvest. On no account should the weeds be allowed to seed. The ground should be worked in March and again at seeding time in May.

Vegetable Parasites.—Mr. E. Cooper contributed a paper. The application of boiling water to grub-infested cabbages or cauliflowers, he said, would destroy the grubs without injuring the plants. Kerosine emulsion was used for this purpose in the United States of America. Slaked lime (four parts) and tobacco dust (one part) constituted a very effective dry spray, which remained on the plants for a considerable time, and destroyed insects which attacked the leaves.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Angaston, July 25.

(Average annual rainfall, 22·25in.)

Silver Jubilee.—The silver jubilee of this Branch was commemorated by a public gathering, held in the institute hall. A large number of visitors, in addition to members, attended. The Hon. Secretary (Mr. E. S. Matthews) gave a résumé of the work done by the Branch since its inception in 1888, and made eulogistic reference to the support it had received from a large number of influential gentlemen resident in the district who had been members during the years of its currency, and some of whom were still on the attendance roll.

Blyth, August 15.

(Average annual rainfall, 16·46in.)

Present.—Messrs. A. L. McEwin (chair), J. S. McEwin, P. H. Zweck, J. J. Clarke, W. and J. Pratt, M. and T. Williams, A. A. Schulze, W. J. Ninnes, R. Buzacott, C. Lehmann, W. H. Best, F. T. Pedler, J. F. Bishop, H. Neumann, J. T. Harmer, A. Dunstone, J. R. Evans, A. D. Pedler, H. W. Eime (Acting Hon. Sec.), and three visitors.

Care of Brood Mares.—A paper was read by Mr. C. Lehmann, dealing with the above subject. At the mating season, the writer said, mares should not be worked too hard. When visibly in foal they should be kept in good condition without being allowed to get too fat. Record should be kept of dates, so that proper arrangements could be made for foaling. If possible, at this time, mares should have a small paddock to themselves near the house. The writer then proceeded to describe what assistance might be given at parturition. Continuing, he said that in some instances it was necessary to teach the foal to suck, and failing this, to milk the mare into a warm jug and induce the foal to get a taste for the milk. He did not believe in working mares after foaling if it could be avoided, but he would work them right up to that time with discretion, for exercise was absolutely necessary.

Clare, July 18.

(Average annual rainfall, 24·30in.)

Present.—Messrs. J. Dux (chair), J. Scales, A. Hill, H. A. Hanna, B. Lloyd, M. L. Nolan, F. W. H. Lee, F. J. Knappstein, J. H. Knappstein, F. Pink, D. Menzie, W. Pattullo, and P. H. Knappstein (Hon. Sec.).

Poultry-Breeding and Feeding.—The following paper was read by Mr. F. J. Knappstein:—"The poultry industry has advanced by leaps and bounds since the Government has taken an active part in it. Thanks are due mostly to the expert (Mr. Laurie). Poultry-breeding requires patience and perseverance, coupled with cleanliness and regularity. The first essential is a nice site for yards, with plenty of space. The house should be built of iron—the uprights angle iron, and roof and walls galvanized iron. Tick is not then so troublesome as it is on wood. The houses should have plenty of floor space, they can then be used as scratching pens on cold, frosty mornings. They should face the east, if possible; the perches should be round and all one height, because fowls have a tendency to crowd together on the top perch, which is not healthy. Make a nice hard floor, so that it can be cleaned easily. The yards should be on a slope if possible, so that they will drain well. A yard 38ft. by 10ft. will be ample room for from six to eight birds. Plenty of water is necessary. The selection of stock is the main point, and if people only thought a little before buying their birds there would not be so many failures. I do not favor buying a pen of fowls that have broken a record or anything like that, because those fowls have taxed their vitality. Purchase fowls from a breeder who has proved himself in public tests, because a breeder who has done well in tests knows a bad fowl from a good one; and, as a rule, he sells out his inferior birds before the breeding season comes on. This applies both to laying and table fowls. The breeds I favor fo laying are the Leghorns (both white and brown), Black and Buff Orpingtons, Silver Wyandottes, and Langshans. The White Leghorn is absolutely the best. Some people do not like these Mediterranean breeds on account of being non-sitters, but I like to see a yard with White Leghorns or Black Orpingtons. The Black Orpingtons are good layers of brown-shelled eggs, and are very consistent if bred from good stock. The same thing applies to Buff Orpingtons, Silver Wyandottes, and Langshans. The Leghorns are the most consistent of the lot, and have produced 250 and more eggs each a year. They are hardy, and not subject to diseases like some of the other breeds. Minorcas lay a very large white egg, but are not very consistent. For table fowls a good Indian or Malay game cock crossed with Buff Orpington or Faverolle hens is best. Birds of the block type, not long in the legs, are required. Table fowls should have white or yellow legs, as they look cleaner and sell better. An Indian-Buff cross is worth from 2s. 6d. to 3s. 6d. at six months old, even earlier if they are forced. Some people like the Langshan-Buff Orpington cross, but it is too leggy and the legs are black. For hatching chickens I prefer the incubator to the hen. Where people only go in for a few fowls they should always keep some of the heavier breeds I have just mentioned. It is hardly worth while buying an incubator in the case of a man who only keeps about 20 fowls, but for anybody who is going in for poultry on a large scale an incubator is a necessity. The machine is very simple to work; it only takes as long to turn the eggs and trim the wick as it does to feed and water a hen. All sizes—30, 60, 100, and so on up to 500 eggs can be purchased. When sitting a hen always make a nest on the ground in some quiet and dark place, if necessary, away from the other fowls. Put the hen down in the evening, after putting in some straw and sprinkling the nest well with insectibane or some other insecticide, with about two or three dummy eggs under her, and cover her until next evening, then give her the eggs if she is willing to sit. Never put food and water too close; make her come off the nest to feed. A sitting hen should always be fed on grain; under no consideration give her mash. It takes from 20 to 21 days for eggs to hatch. Chickens of laying breeds should be fed from the start on small grain, such as hemp seed or crushed wheat mixed with a little chaff, to encourage them to scratch. Greenfeed chopped up fine is very good for them. Keep them on the small grain till they are about a month old, and then feed whole grain, such as wheat, oats, barley, and buckwheat. When they are between 6 and 7 months old give them mash in the morning, green feed at mid-day, and grain at night. A mash is made up of one part bran and two of pollard, with a little meat meal mixed in with it. It can be fed warm on a cold morning. Never give fowls sloppy food. Never feed in a trough; it cannot be kept clean. Have the mash so stiff that as it falls from the hand to the ground it will break, and feed on clean ground. Have plenty of grit, such as small sea shells, broken up bones, lime rubbish, and gravel where the fowls can get at it; also some fine charcoal. Too much meat meal will result in loss of feathers and general ill-health. The table fowls can be fed from chickens on mash and small grain. Do not give mash every feed, but once a day. When the fowls are ready to top up confine them in a small space. Two weeks should be sufficient in which to bring them to prime condition. If kept after that they cease to improve, they again immediately lose flesh. The best food is bran and pollard, with a few peas for a change; always give it hot. The fowls may be kept in well-ventilated coops, being fed three times a day, and allowed plenty of gravel and water, except for the last week; then stop the gravel. The coops, of course, must be kept clean, and should be small enough to prevent the fowls turning round. They should be littered with clean straw and never allowed to get foul. If instead of water, their drink is skimmed milk they will do better. It is not wise to dabble with several varieties. Select one or two. The aim is to get experience, no one can succeed without this. Be sure that plenty of dust for bathing, such as wood ashes, is supplied at all times. It is a great remedy against lice, to which fowls are especially liable. This, with plenty of shell grit, sand, good clean water, and liberal feeding will ensure success, both in eggs and chickens. Do not crowd the house; see that everything is kept thoroughly clean. Mating requires a great amount of knowledge. The hens of activity, bright in comb, sparkling in the eye, and showing vigor, and often seen in the nest box, should be bred from. The beginner can easily detect the best from his limited number. The male bird should be purchased from a specialist. A good breeding cockerel is always worth a guinea. He should be active and alert, and show good standard points of his breed. The eggs will not be fertile for eight or 10 days. Of the heavy breeds, eight hens to a cockerel is sufficient; in the light breeds anything from 10 to 20 hens can be given with good results. Chickens hatched out by an incubator must have every attention. Nature has provided the chick with its food for three days after hatching. The nearer one can get to that food the better the results. For the first week feed on coarse oatmeal soaked two hours before using; a trough containing bran and pollard may be left after the first week. Green food should be fed once a day. Chop this up fine and feed at noon. As soon as possible the sexes should be separated, this can be done at the age of 2 months." Mr. Knappstein mentioned that it was the desire of the Poultry Expert to establish in the future laying competitions the regulation that each pen must contain 10 hens instead of six hens, as it was at the present. This was not fair to the smaller breeders, as they could not spare 10 hens from their yards. He maintained that it was helping the larger breeders to increase their number, and asked this Branch to take the matter up in the interests of the small breeders in this district. Mr. Menzie said poultry-breeding looked a good paying proposition on paper, but he did not know whether it was so good in practice, as he had heard of a few failures. Mr. Nolan thought poultry were profitable up to a certain extent, but when a man went in for it on a large scale and had to employ labor, and purchase a costly plant, it would swallow up the profits. Mr. J. Scales said his experience with poultry was that they were not profitable. He could never keep them out of the horse's mangers from scratching the horse's fodder, to its detriment.

Clare, August 15.

(Average annual rainfall, 24·30in.)

Present.—Messrs. J. Dux (chair), W. J. Maynard, F. J. Knappstein, F. Pink, F. J. Gerteau, G. Victorsen, A. Dunstan, B. Lloyd, A. Hill, J. Berridge, H. Hanna, W. Patullo, C. Pink, P. Pascoe, F. Hicks, M. L. Nolan, C. Jarman, C. Neate, J. H. Knappstein, and P. H. Knappstein (Hon. Sec.).

Black Spot on Vines.—In reply to an inquiry as to the best treatment for black spot on vines, the following was recommended:—7lbs. sulphate of iron, 1 pint sulphuric acid, and 2galls. water, mopped on the affected parts.

Care of Implements.—Mr. H. A. Hanna read a paper on this subject, in which he urged the necessity for proper shed accommodation for farm implements. A coat of boiled oil should be applied every two or three years, and the appearance of the plant was improved by the addition of paint. Continuing, the paper read—"The cones in the manure-box of the drill should be thoroughly cleaned, also dirt or grease that has gathered about the oil cups and bearings, as there is nothing that wears out a bearing more quickly than a mixture of oil and grit. Having cleaned all the parts, they should be oiled to prevent rust. This overhauling applies to the binder, which should be cleaned and the knives sharpened and then oiled, so that instead of rusty knives, one has them clean and sharp to commence operations. The ploughs should have their share of attention. To prevent rust on mouldboards, smear them with grease, and there will then not be the inconvenience of stopping every few chains on account of the boards clogging with dirt. Broken or worn out parts should be replaced at once. The habit of leaving the cleaning and repairing until the machine is wanted often means that it is not repaired as it should be, because the harvest or seeding has come with a rush. Consequently worn parts break and leave the farmer stranded in the midst of work, causing loss of valuable time."

Friedrichswalde, August 16.

(Average annual rainfall, 18in. to 19in.)

Present.—Messrs. F. Heintze (chair), R. Marlow, F. W. Duldig, T. Pfitzner, G. Grope, J. Heintze, F. W. Schütz, P. Goodfellow, Coombe (Hon. Sec.), and five visitors.

Horses and Harness.—The following paper was read by Mr. F. W. Duldig:—"It is essential that horses should be well cared for in every respect, and that their harness should fit. It is advisable, in buying harness, to see that the material is good throughout, even if it costs a few shillings extra. In the case of winkers, it is necessary that the eye flaps should be sufficiently high to prevent the horse seeing over the top. The bit should be comfortable in the horse's mouth; if it is too tight it is irritating to the horse and to the driver. If the winkers are too long there is a danger of the horse taking the bit between his teeth. Every horse should have its own collar. It is advisable to buy a pipe collar, and one of good material, as the better class appears to fit better than the cheaper. They also keep their shape better. The collar should be well rounded at the top, to avoid pinching the horse's neck. When working a drill, or binder, or any implement which requires the horses to carry weight on the neck, they will almost invariably get a sore neck if the collar is narrow at the top. I think the angle steel pattern of hames the best, as these fit closely into the groove of the collar, and very seldom move. In most cases it will be found that the hame hook is too low, and it will pay to take the hames to the blacksmith and get this fastened higher up. Backbands should be on the chains, as these keep the direct pull of the horse on a level with the shoulders, and take a certain amount of weight off the horse's neck. There is less risk of the horses getting their legs over the chains. Oil, a few stitches, and copper rivets will greatly assist in lengthening the durability of harness. If slow and fast horses are to be worked in the same team, the fast animals should be tied back. The best method is to fasten a strap, with a strong ring attached, through both bit rings and under the jaw. Another strap should then be fastened to the next horse's rein ring on the hames through the ring under the horse's jaw, and attached to the rein ring on the harness of the horse on the other side. I prefer working horses tandem as much as possible, as a lot of heavy swings are abolished, and the horses are not so likely to tread on each others hoofs. I do not favor equalisers for the leaders, as the body horses have no opportunity to ease the collars on their necks. Three or four strong links do just as well." In the discussion which followed, Mr. J. B. Coombe thought that each horse should have a collar fitted, and it should be tight into the neck when the animal was working, so that the weight of the pull would be borne by the muscles and not the bone of the shoulder. He also favored the old-fashioned long hames, as with these a more even pressure all round the collar could be obtained. Mr. P. Goodfellow and others believed in using equalisers for the leaders in tandem teams, as they would then be pulling by leverage and not a dead pull, which was certainly easier for the horses.

Julia, August 13.

(Average annual rainfall, 18in. to 19in.)

FIELD TRIAL.—The Branch reports having held a successful field trial of stump-jump implements, near Hampden Siding, on August 13th, on the Anlaby Estate property, by kind permission of the manager, Mr. De Lucas. Fine weather favored the undertaking and a good attendance was the result, fully 200 people being present. The trial field consisted of both good and rough land, which gave the implements a splendid chance to demonstrate their respective merits. The entry list, considering the season, and also that this was the first trial undertaken by the Branch, was satisfactory; there were 18 entrants. A field committee consisted of Messrs. T. Brown, R. W. Rowell, J. Dunstan, T. Carter, and A. Pfitzner, and five teams of horses were supplied by members of the Branch. The judging was done on points, and the judges, Messrs. T. Prior, D. Heaslip, W. Poulden, J. Jaffer, and, J. T. Freeman were kept very busy. The points awarded the respective exhibits by the several judges were totalled and the sum divided by five to secure an average award of points; on this the results were determined. Results: Ploughs—first, Clarence Smith, Limited, Ardrossan, 83·80 per cent.; second, Jansen Bros., Eudunda, 82·20 per cent.; third, H. H. Prior, Marrabel, 80·00 per cent.; other competitors, 79·40 per cent., 68·40 per cent., 56·00 per cent. Cultivators—first, H. W. F. Klaebem, Eudunda, 89·90 per cent.; second, Vogt Bros., Kapunda, 80·60 per cent.; third, Linke Noack, Freeling, 79·80 per cent.; other competitors, 79·20 per cent., 78·40 per cent., 76·60 per cent., 74·80 per cent. Skim ploughs—first, Clarence Smith, Limited, Ardrossan, 77·20 per cent.; Linke Noack, Freeling, 74·80 per cent. Harrows—first, H. H. Prior, Marrabel; second, C. Morick, Point Pass; J. G. Traeger, Hamley Bridge.

Julia, August 16.

(Average annual rainfall, 18in. to 19in.)

PRESENT.—Messrs. T. Prior (chair), A. Pfitzner, D. Heaslip, C. Nash, W. Hall, J. Dunstan, R. W. Rowett, G. Gaerth, W. H. Neal (Hon. Sec.), and two visitors.

Care of Working Horses.—Mr. D. Heaslip read a paper, as follows :—" Colts should be ready to work at 2½ years old, but should be worked only for a short time at first, to allow their shoulders to get used to the collar. In fact, any horse should only be worked a short time for the first two or three days after spelling. Sore shoulders are often caused through fast driving and long day's work at first. Horses should not be troubled with sore shoulders at all if proper care is taken and well-fitting collars and hames are used, and that each horse always works in his own harness. Collars should last seven or eight years without being restuffed. They should be well attended to, and often tapped from the outer edge with a round stick or bottle. All harness should be well cleaned at least three times a year. Collars should always be turned lining upwards to dry at dinner time on dry days. I strongly believe in always watering a horse before it is fed. The horse with harness on cannot feed in comfort. The foal should be weaned at 5 or 6 months old and well fed, particularly until 1 year old. I have a great objection to horses being tied up at night ; they should have their freedom, so that they can lie down or roll if they wish. They should have a warm stable with a fair-sized yard in front, and a good stack of straw to rub against and help to keep them warm. Give as much good feed as they can eat when working hard, and feed two hours before going to work in the morning ; at other times give enough to keep them in good condition. Horses are often taken to the township, and to sports, and various other places and tied up all day, and often until early morning without feed, which is a cruel shame. Too much care cannot be taken with the horses' hoofs. If these were rasped and kept in proper shape two or three times a year there would be little need for shoeing the ordinary farm horse. A young horse often grows a long hoof, and it is often the best hoof, but through being left too long a piece often breaks out ; this weakens the other, and it also breaks, and often into the quick, which makes the horse sore-footed. We see many unsightly hoofs with large pieces broken out, for the want of little attention. Rock salt should always be kept in the feeder."

Mallala, August 4.

(Average annual rainfall, 16·88in.)

Present.—Messrs. J. Curnow (chair), A. V. Nairn, J. Nairn, S. Temby, F. and W. Konzag, W. McCabe, J. J. McCabe, E. Penfold, T. H. Warden, A. E. Temby (Hon. Sec.), and two visitors.

Feeding and Care of Horses.—The Hon. Secretary read a paper, from which the following is taken :—" Horses should have three good feeds of chaff daily and one of long hay at nights. Have regular hours for feeding, and do not give them enough at a time to last for several meals. Green wheaten hay makes the best chaff. Change the variety of feed occasionally, but always avoid giving musty hay or chaff. Old or low conditioned horses should have bran with their chaff, and be fed by themselves. It is not necessary to give the others bran unless they are doing heavy work for long hours. Mares in foal can be worked up to within a few days of foaling without harm. Then they should be put into an enclosure, with plenty of feed and water, by themselves. As a rule, foals are weaned when they are six months old. Lock them right away from the mares, and give them plenty of bran and chaff, and greenfeed occasionally, if obtainable. After they are weaned, allow them to come into the stable with the other horses. They are then quieter to handle. I think young stock are better if left until they are 2½ years to 3 years old before being broken in. Then only give them light work for half-days to start with. All working horses should be groomed at least once a day. Always pay special attention to their shoulders, and treat any sores immediately. For sore shoulders, some recommend powdered black lead mixed with clean melted lard. I have always found that a little turpentine mixed with vaseline answers very well. I prefer a well ventilated stone and iron stable with a good sized yard attached. With the iron roof there is not the risk of fire, nor the harbor for birds, as with the straw roof. Have the yard made of sawn timber, four rails, and 5ft. 6in. high. Divide the stable into stalls large enough for two horses to feed at, say, about 10ft. wide, using sawn timber. It is always advisable to have a fairly large loose box at one end. Avoid using wire around the stable yard. Do not tie horses up to the manger at nights, as they do not get the necessary rest. Leave the gate open after feeding at night, so that they can exercise themselves. Have the water-trough in the yard. This not only saves the time and trouble of taking them to drink, but the horses are more contented if they can have a drink when they please. Care must be taken to keep the trough clean. The stable and yard should also be cleaned regularly." Mr. J. Nairn preferred an iron-roofed stable, but would not divide it into stalls. He always kept a straw stack handy to the stable yard. The best policy to adopt when weaning foals was to allow them to have one drink from the mare daily for a while. Mr. A. V. Nairn would break in the colts at 2 years. It was a better practice when weaning foals to put them in an open paddock with plenty of greenfeed. Mr. J. McCabe would not feed horses on long hay unless it consisted of a fine-strawed variety of wheat. He allowed foals to have one drink per day when weaning them, otherwise it was necessary to milk the mare for the first three days. He would break young horses at the age of 2 years, if they were in good condition. Mr. W. McCabe preferred leaving them until 2½ years old.

Nantawarra, August 14.

Average annual rainfall, 15·90in.)

PRESENT.—Messrs. T. Dixon (chair), R. D. Nicholls, S. Sleep. W. Smith, W. Greenshields, R. P. Uppill, and G. S. Tucker (Hon. Sec.).

FRICTION.—In a paper on this subject, Mr. Smith said friction was reduced by the application of oil between the bearing surfaces, which prevented the metals coming into contact. Implements with quickly revolving parts, such as chaffcutters, engines, harvesters, and binders, without self-aligning bearings, should have the spindles set in proper alignment. Cheap lubricating oils played havoc with bearings, and increased the draught. Kerosine occasionally applied in the place of the oil would clean out any accumulation of old oil and dust. Grease was better than oil for plough and cultivator wheels fitted with oil cups on the outside. *Sore Shoulders.*—The best treatment in connection with this trouble was to tack a lining of tanned sheepskin to the inside of a well-fitting collar, and keep this well saturated with a mixture of oil and liquid carbolic. The former kept the collar soft and the latter was an antiseptic. *Master and Laborer.*—A great deal of friction between the farmer and his man could be got over if it were remembered that both were subject to human weaknesses. The careless employé and the nagging employer were not the rule, but they nevertheless existed. Mr. Sleep had found it impossible to work some horses without their getting sore shoulders. He did not believe in ill-treating animals, but if some horses were only worked when their shoulders were not sore it would not pay to keep them. In regard to friction between master and man, there was absolutely no need for it if the oil of commonsense were applied. The man that would stand a nagging master was not worth keeping. Mr. R. D. Nicholls believed that the extent of friction was in the ratio of 4 to 1, *i.e.*, well-oiled machinery which could be worked with one horse would require four horses if unoiled. He advocated the use of plenty of oil, but there was room for improvement in regard to its application, as there was too much wasted. It was a common sight to see oil over parts where there was absolutely no friction. A good deal of the friction between master and man could be avoided by a give-and-take policy. There were many things, small in themselves, which counted for much, such as a day off now and again, &c., which would help materially in creating a better understanding between employer and employé. Mr. Dixon had a horse that was very subject to sore shoulders. He tried new collars, the hollowing out of old collars, &c., but without effect. He found, however, that the best way to work the animal was in a steel collar around which bag had been wrapped. He believed in hollowing out collars in case of sore shoulders. Mr. Smith, in reply, said waste occurred through using oil which was too thin. He used common cylinder oil mixed with carbolic for sore shoulders for his horses, and found it effective. The trouble was due, to a certain extent, to infection and uncleanli-

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Salisbury, August 5.

(Average annual rainfall, 18·57in.)

PRESENT.—Messrs. Moss, McNicol, E. V. Harvey, Tate, Frost, McGlashan, James, Shepherdson, Neal, Judd, Bagster, Whittlesea, Short, Urlwin, Fleet, Jenkins, and two visitors.

QUESTIONS.—In reply to questions handed in, Mr. E. Tate said that artichokes were of little value as feed to cows or sheep. Field peas were better planted so that they were just covered by the soil, but not deeper than ½in. Sowing about July was advisable, as the early sown crops were generally rank. About 2bush. of peas and 80lbs. or 90lbs. of super. should be used to the acre. Mr. F. Frost thought six cows would pay better than 50 breeding ewes in this locality, if it were not necessary to employ labor. If hand fed, he said, 200 sheep could be kept in the place of six cows. For lucerne in this district spring sowing of Hunter River variety was recommended. The best sort of wheat for hay was Baroota Wonder, but King's Early and Le Huguenot were the best for feed.

Two Wells, July 12.

(Average annual rainfall, 16·36in.)

PRESENT.—Messrs. P. C. Cooper, J. J. Rowe, J. J. Secomb, R. Kenner, H. M. Kenner, E. H. Green, H. Goss, W. S. Corden, and L. H. Dawkins (Hon. Sec.).

FALLOWING.—In a paper on this subject, Mr. H. Goss said heavy black soil could be advantageously ploughed in February or March when it was dry, to a depth of 5in. or 6in. It would work much lighter than if ploughed at the end of August or September. The fallow should be harrowed down not later than August and cultivated in September, and again in October or November, to just sufficient depth to destroy weeds. Light scrub land should not be ploughed when drying, and not more than 3in. or 4in. should be cut and turned over. Heavy clay land should be ploughed when just wet enough to allow of the plough working properly, the depth of working being regulated by the depth of soil. It should be harrowed in August and September, care being taken not to go on it when it was too wet, or the surface would be found to run together. Sandy land should not be ploughed too early, on account of its liability to drift. The plough could be best put in about the end of August or the beginning of September, the cultivator following just before the hay harvest; the soil being left rough, which would to a certain extent discourage drifting. In discussing the subject, Mr. H. W. Kenner said clay land should be ploughed early and harrowed as soon as possible afterwards, and sandy land should be ploughed late. Mr. R. Kenner advised the exercise of case to prevent clay being brought to the top. Mr. Cooper did not advise deep ploughing. He favored fallowing scrub land with the cultivator.

Watervale, August 11.

(Average annual rainfall, 27·17in.)

PRESENT.—Messrs. E. E. Sobels (chair), J. Pope, G. Hunter, R. Weymiss, N. Grace, T. Burgess, A. Burgess, W. Smith, H. Baker, D. Guthrie. O. Dunstan, A. Davis, J. Ward, sen., F. Hamp, J. Hamp (Hon. Sec.), and one visitor.

POTATOES.—Mr. Guthrie, in speaking of the suitability of this district for intense culture, said the land was capable of producing more than it was yielding at the present time. He believed the time was not far distant when families would obtain a living from about five acres. He intended going in for potato-growing, and asked for information as to the best varieties to plant and also regarding the cultivation of the land. Mr. Hunter recommended Pinkeye and Up-to-date as the most suitable sorts for this district. He would plough the ground deep and work it well and plant the sets 9in. apart, with 2ft. between the rows. If the seed were large he would cut them to one or two eyes on each set. Members agreed that potato-growing in this district would not be a very profitable undertaking unless the crops were irrigated.

PEAS.—Mr. Pope said it would pay owners of small blocks to sow peas, even if they were to take the place of bare fallow. The ground would greatly benefit on account of the addition of nitrogen to the soil. The best way to harvest the crop was to turn either pigs or sheep on to them when ripe. Mr. Burgess believed that peas, as well as many other such fodders, could be grown profitably.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Bute, August 12.

(Average annual rainfall, 15·42in.)

PRESENT.—Messrs. J. H. Barnes (chair), W. H. Sharman, M. Stevens, W. Buchanan, A. Schroeter, R. C. Commons, B. Lamshed, W. T. Matthews, E. W. Bettes, J. Trainor, W. Gardner, and L. E. Simon (Acting Sec.).

BULK HANDLING OF WHEAT.—Mr. S. Trengove introduced a discussion on the bulk handling of wheat. He was of the opinion that it was bound to come as the expense to farmers for cornsacks was now about 50 per cent. more than it was some years ago and there was no doubt there would be a further increase of 50 per cent. before long. There was too much rubbish shipped, and the freight on this was the same as on clean wheat. Mr. J. H. Barnes said that the paper which was read and discussed at the Whyte-Yarcowie Branch showed the cost of cornsacks, but did not state what would be the cost of the elevator system. No reference was made to the expenditure which would be incurred in altering conveyances, construction of trucks, and facilities at shipping ports which would have to be borne by the taxpayer. Mr. E. W. Bettes urged that the elevator system should be given a trial. Mr. L. E. Simon opposed the introduction of the bulk handling of wheat. If it were introduced at ports such as Port Adelaide, Wallaroo, Pirie, and Port Augusta, there would still be a large number of ports from which wheat in bags would, of necessity, have to be shipped. The farmers who marketed their wheat at these ports would have to contribute, through taxation, to the cost of erecting elevators at the ports mentioned. Mr. W. Buchanan referred to the fact that in Canada facilities were provided for the bulk handling of wheat, but he was of the opinion that the time was not ripe for its introduction in South Australia.

TWELVE YEARS AS HON. SECRETARY.—Eulogistic reference was made to the fine work in the interests of the Branch which had been done by Mr. L. McCormack, who was resigning from the office of Secretary and Treasurer, which he had held for 12 years, on account of leaving the district.

Kadina, July 10.

(Average annual rainfall, 15·88in.)

PRESENT.—Messrs. J. Malcolm (chair), R. Correll, J. N. Pedler, G. Bruce, B. N. Rodda, A. Paterson, and one visitor.

SHEEP ON THE FARM.—Mr. R. Correll contributed a paper on this subject. The farmer should, he said, discard the pure Merino in favor of the Lincoln-Merino cross or the English-Leicester cross. Continuing, the paper read:—"If a demand for these cross-bred ewes grows up as it should do, there are many people favorably situated for breeding them. The farmers should buy them as two tooths, and they could easily get four crops of lambs from them, and after that they could get more for the aged cross-bred ewe than they would for an aged Merino ewe, which would compensate for the extra price originally paid. The great advantage, however, is that the lambs will probably average 4s. or 5s. a head more. In addition there will probably be 20 per cent. more lambs, as there is always a loss with the Shrop. put to the pure Merino. The cross-bred ewes bring their lambs on better as they do not grow such a heavy fleece, and are much better mothers. The flesh is of a better color. This is the class of sheep that Professor Lowrie has been advising the farmers to go in for for a long time, and his address at the Saddleworth Conference, reported in the May *Journal*, is worth studying. It is true that this is a bad season to talk of lamb-raising to the farmers, but it is fair to assume that we are not likely to get similar conditions again for a number of years, so we may anticipate that fair average seasons are in front of us, and make our arrangements to keep sheep accordingly. There is one thing that we should not lose sight of, and that is that our export trade is likely to be good, and will improve if farmers put a good even article on the market." In conclusion, the writer urged the erection of a co-operative dip, and suggested that an effort should be made to secure special facilities for trucking lambs and sheep direct to the freezing works at Port Adelaide. In discussing the subject Mr. Paterson thought it inadvisable to trust to crossbreds alone. He recommended a cross with the Merino. Mr. Pedler thought it better to confine attention to one breed. He had averaged 10s. a head for lambs, and 9d. per pound for wool. Messrs. Bruce, Rodda, and Gordon also spoke, and urged all farmers to keep sheep and to cut straw from the stubbles to stack for winter feeding.

Minlaton, July 17.

(Average annual rainfall, 17·41in.)

PRESENT.—Messrs. J. Martin (chair), E. Correll, S. Vanstone, J. Boundy, D. M. S. Davies, J. W. Griffiths, A. Washington, R. H. McKenzie, A. D. McKenzie, A. D. Southerland, T. Giles, R. H. Tillbrook, J. McKenzie (Hon. Sec.), and one visitor.

DRY BIBLE.—Mr. Martin reported that one of his heifers appeared to have been attacked with this trouble. He gave her three packets of Epsom salts in the form of a drench, and several scalded bran mashes. The animal showed every sign of recovery.

Annual Report.—The Hon. Secretary read the annual report of the work of the Branch. This showed that 12 meetings had been held, in addition to one homestead meeting and a lecture by the Poultry Expert.

Minlaton, August 21.

(Average annual rainfall, 17·42in.)

Present.—Messrs. J. W. Griffiths (chair), J. Martin, J. A. O'Brien, H. A. Chester, C. Parsons, E. Correll, D. McKenzie, A. Washington, R. O. Page, R. H. McKenzie, A. D. Southerland, A. D. McKenzie, and J. McKenzie (Hon. Sec.).

Peas.—Mr. Parsons, who had had considerable experience in growing peas, did not think it advisable to feed them off. He had sown this crop on sandhills to prevent drift, and the results were good. Peas made excellent fodder, and could be preserved as ensilage.

Paskeville, July 21.

(Average annual rainfall, 16·10in.)

Present.—Messrs. J. P. Pontifex (chair), J. S. Bussenschutt, S. R. Price, J. Rundle, F. H. Bussenschutt, W. Rodda, E. W. Bussenschutt, T. E. Eylward, P. A. Uren, A. Goodall, G. H. Bammann, and one visitor.

Manuring.—Mr. Bammann contributed the following paper:—"Manuring the soil becomes necessary only when land has been to some degree exhausted of its available plant food. According to Jebro Fall, the originator of drilling and horse-hoeing, tillage might take the place of manure. By thorough tillage he grew wheat year after year on the same ground without manuring. He held that the decay of straw and stable manure in the soil was useful only in causing such a separation in the particles of earth as to reduce them to the condition of plant food—that is, to the soluble condition. He denied the actual manurial value of stable manure, and attributed its beneficial effect to its preventive and communicative action to the soil. In his day, farmyard scrapings was the only manure in constant use, and his view was, no doubt, partly correct. The mechanical effect of decaying vegetable and animal matter in dividing and pulverising the soil is fully allowed, as is also the carbonic acid evolved during decay upon the mineral matter of the soil." Mr. Goodall considered it quite possible, that by intense tillage, heavy dressings of farmyard manure, thereby providing a sufficiency of humus in the soil, and a very generous rainfall, profitable returns might be secured for a number of years successively, but still he would be inclined to question the wisdom of such a procedure in this district. Mr. Pontifex thought good results could be obtained by intense tillage and the ploughing in of vegetable matter and stubble, providing the ground was suitable.

WESTERN DISTRICT.

Elbow Hill, July 19.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. W. T. Cooper (chair), F. Freeth, E. Wake, J. F. Brooks, L. Wheeler, A. Ramsey, G. F. Wake (Hon. Sec.), and two visitors.

Wheaten Straw.—A paper was read, in which the writer advocated the erection of small straw stacks on different parts of the farm. These would be readily eaten by horses in cold weather or times of drought. Chaffed, and mixed with pollard, the straw made a good feed for working horses during the off season. Its value as a shed covering, also, could not be overlooked. Members generally agreed that the straw was of value as stock feed. The Chairman thought it necessary to add bran when feeding. If bound, the straw would be gathered free from dirt.

Goode, July 25.

(Average annual rainfall, 12in. to 13in.)

PRESENT.—Messrs. W. Folland (chair), C. Will, J. Rohrlach, Gene, W. Morcombe, W. Tainsh, H. Will, N. Packer, C. Lutz, Hughes, W. Burner (Hon. Sec.), and eight visitors.

HOMESTEAD MEETING.—Members took the opportunity of visiting the farm of Mr. N. Packer, and inspected the crops.

TANK-BUILDING.—Mr. W. Folland read a paper on this subject. The first essential in connection with the conservation of water on the West Coast, he said, was the selection of a site, on which a good run was assured, for a tank. One with a capacity of from 20,000galls. to 30,000galls. was quite large enough, as there was always a danger of it bursting, on account of the weakness of the ground. Fairly steep sides would be found to stand the strain better. For building, he advised mixing rubble, sand, and lime in the proportion of three, one, and one in the bottom of the tank, allowing it to stand for a couple of days to toughen, and then adding more water. A rough coating of from 4½in. to 5in. in thickness should be thrown on to the walls with a shovel, working right round the tank in tiers. The floor should be put in when the walls were finished. In the course of a day or so cracks would probably appear; these should be well filled. The walls and floor should then be plastered with a mixture of three parts sand and one of lime to a depth of 1in. to 1½in., leaving a good surface. Three parts of sand and one of cement should then be mixed dry on a piece of galvanized iron. This should be put into a kerosine tin with one side cut out, have water added, and be well stirred. It could then be applied to the wall with a hair broom, beginning at the top. By this means a good coat of cement would form at the weaker parts of the tank, *i.e.*, at the bottom of the walls. When this had dried tar should be applied, and then tar and pitch. Care should be taken to prevent the water getting behind the concrete, and good inlets and outlets should be provided. The roof, which would minimise evaporation, could advantageously be put on before the cementing was done, thus protecting the drying cement from too much action on the part of the sun. Mr. C. Will thought the cement should consist of two parts cement to five of sand, as the sand was not of good quality. Mr. Burner said amateur builders would do better by building round tanks. Mr. Whitelaw (a visitor) thought iron roofs cheaper than boughs in the long run, and there was the disadvantage with the boughs that they provided a breeding ground for red worms.

Goode, August.

(Average annual rainfall, 12in. to 13in.)

PRESENT.—Messrs. W. Folland (chair), H. L. Will, L. B. Hughes, W. Tainsh, N. Packer, J. Whitelaw, V. J. Tonkin, H. Packer, J. G. Rohrlach, W. Morcombe, W. Burner (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—Members visited the homestead of Mr. J. G. Rohrlach. The crops were found to be healthy, but backward. Particular interest was centred in a large flock of fowls, well kept, and nice looking pigs.

SHED ACCOMMODATION.—Mr. Tonkin thought straw sheds best for horses, as they were cool in summer and warm in winter; iron sheds were preferable for implements. Mr. Tainsh preferred iron for both, on account of the water catchment provided. Mr. J. Whitelaw preferred iron sheds, open to the east, with the chaff shed on the opposite side to the mangers. Members generally agreed.

Koppio, August 14.

(Average annual rainfall, 22·40in.)

PRESENT.—Messrs. W. R. Richardson, (chair), R. F. Richardson, T. Brennand, J. Newell, G. Howard, J. Liddy, G. Miller, sen., T. R. Gardner (Hon. Sec.), and three visitors.

SHEEP ON THE FARM.—Mr. J. Newell read a paper, in which he said the value of sheep on the farm was not generally realised. They were of considerable use in keeping the land clean, as well as providing the meat supply. It was not wise to purchase old sheep; those between two-tooth and full-mouth were best. Overstocking should be guarded against. Short, thick-woolled Merino ewes, of large frame, crossed with Romney Marsh rams were best for this district. He has been very successful with this cross, the loss at lambing being very slight. The progeny were not only good mutton sheep, but produced a good saleable class of wool. They were excellent mothers, and when crossed with the Merino ram yielded an ideal farmer's sheep, large-framed, hardy, and carrying an excellent fleece. Tailing should be done when the lambs were about two months old. One good sharp knife should be provided for the tail and another for the purse. Fire-branding, as well as ear-marking, was advised. Separate yards should be provided for catching the lambs and placing them in after treatment. These could be made of 3ft. 6in. pig netting, with posts 6ft. apart, and four wires. Mr. R. F. Richardson thought medium-woolled ewes would be better than the Merino. Members agreed that sheep should be kept on all farms.

Mangalo, July 19.

(Average annual rainfall, 14in. to 15in.)

Present.—Messrs. A. G. Burton (chair), W. E. Waters, S. Burton, J. C. Busch, H. S. and H. C. Mackley, H. C. McMartin, C. H. Klingberg, J. H. Cleave (Hon. Sec.), and three visitors.

Care of Farm Implements.—In a paper on this subject the Hon. Secretary said it was a mistake to erect a shed with mallee forks, brush, straw, &c., for covering machinery, on account of the danger of fire. An iron enclosure required no more timber for uprights and rafters, and was more quickly built, and there was the additional advantage of the water catchment provided. The machinery and implements of the average farmer to-day would need accommodation about 60ft. x 24ft. Native timber could be used for uprights and cross pieces, but 3in. x 2in. sawn hardwood was best for battens. The cost of the roof, including nails, guttering, and fascia boards, would be between £22 and £25. Drill boxes, wheels, wagon and dray bodies, if left in the rain and sun, would crack and split. Sand and dust filled these cracks, and further swelling under the influence of rain resulted in a great strain on joints, naves, or spokes, as the case might be. After the first year's work the implements should be overhauled, cleaned, and then dressed with boiled linseed oil, applied with a stiff paintbrush on all cracks, &c. Surplus oil should be carefully wiped off. After a week the whole surface of the machines should be gone over with the oil, a soft brush being used, which would effectively prevent the ingress of water. There would be no swelling or shrinking of the timber, and they would present a well-cared for appearance. A coat of oil every second year subsequently was then necessary. Breakages should be promptly attended to. Members generally agreed with the remarks of the paper writer, and deprecated the tendency of farmers to procure too many implements on the hire system.

Mangalo, August 16.

(Average annual rainfall, 14in. to 15in.)

Present.—Messrs. W. E. Waters (chair), S. Burton, J. W. Deer, H. E. Stienkie, W. J. Deer, H. C. McMartin, A. Schiller, H. C. Mackley, J. C. Bersch, J. Mieglick, J. H. Cleave (Hon. Sec.), and two visitors.

Rabbit Destruction.—Mr. S. Burton read a paper, in which he urged the erection boundary fences with posts 12ft. to 15ft. apart, with the barbed wire on the top, and one plain wire just below. Netting should be attached to the latter, and at least 6in. of this should be buried. This fence needed inspection weekly. Digging out burrows, and the use of ferrets were the best means of destroying the pest. The ferrets should be well fed and muzzled before being put into the burrows. Fumigating and poisoning were also effective. The poison cart could be advantageously used after the first rains of the season, before the grass grew to any extent. Mr. J. W. Deer favored the use of the poison cart. Mr. J. C. Busch recommended the regular use of the poison cart, together with fumigating and filling the burrows. Mr. McMartin had used a drum of bisulphide of carbon on a 100-acre paddock, in which there were a large number of burrows, with very good results. The majority of members agreed that the poison cart was the most effective method of destroying the rabbits.

Petina, June 28.

(Average annual rainfall, 13·19in.)

Present.—Messrs. W. Penna (chair), W. H. Howard, H. Doley, F. Goodhart, J. Souter, W. Schultz, O. J. Howard (Hon. Sec.), and one visitor.

Seeding.—Mr. H. Doley read a paper, from which the following is taken :—" Where one has a large area to put under crop, the sooner it can be got ready for the drill the better. The man who gets his ground ready, and then as soon as there is sufficient rain, pushes on with the drilling, will be best off in the long run. If the summer has been a dry one there is little fear of the grain malting if sown early, but when there has been much summer rain it is wise to wait. Most of the land in this district can be ploughed at any time, but it pays to wait for rain, to allow the grass to grow, and then to work the ground back. The implement I strongly recommend is a spring-tooth cultivator, but the land must be free from rubbish, and where one has rubbish to contend with a disc harrow is good, but the work needs to be done twice. By running the outside disc into the gutter each time the ground is double turned, and it becomes level. I am a great believer in deep ploughing, preferring nothing less than 4in. or 5in. If it is worked up well in the first instance a crop can be put on the stubble the next year. I have had some good results from drilling in on the stubble land that has been free from grass. If the season is favorable almost all the grain germinates, and thin sowing is advisable. I have had the best results with sowing at the rate of one bag of wheat and one of manure to every four acres. In some years, however, it proves to be a little on the thin side, as very often the ground is not right for quick germination, and the consequence is that a lot of the seed is lost. For hay, I recommend thick sowing, say, a bushel to the acre, as straw is wanted; but for stripping I find that with thick sowing the ears are inclined to be small. I am a great believer in grading the seed, or even running it twice through the winnower. By this means a lot of the small and inferior grains are taken out. In this district one needs to thoroughly pickle the seed, and as the country seems to be well suited for the development of smut, I prefer the McCabe pickler. I use ½lb. bluestone to the bag, but with wheat less subject to the disease I use less. Seed wheat requires changing from one locality to another, as almost any new wheat in a district does remarkably well for a year or two, and then it seems to deteriorate. The wheats I find most suitable for this district are the early varieties, and I prefer Steinweidel and Gluyas; Federation also does well, but is comparatively new to the district. Gluyas is best also for hay, as it is very heavy with plenty of grain, the horses like it, and it is generally ready for the binder early. It needs to be cut on the green side, as if left too long it becomes tough." A good discussion followed. Canon Howard suggested that the irregular spacing of grain in the drill rows was attributable to the grain being buried at varying depths, owing to the unevenness of the surface of the soil. Members thought the condition of the drill, or the sowing of damp or dirty seed caused the irregularity. Mr. Penna thought it would be an advantage to have the discs on the drill closer together, thereby distributing the seed more evenly over the surface. Members agreed that in this district it paid to fallow early, as deep as the type of soil would allow, and then to work the fallow. A good deal of trouble was caused by buck bush on the fallow. The best way to keep the land clear was good working. Mr. Goodhart said sheep would keep a large area clean, providing they were put on when the weeds were young. The Secretary spoke of the great damage done to the crops by the crows, and asked for a remedy. He had found poisoned wheat no use. Members had tried dipping pieces of meat in rabbit poison, but without success. Mr. Goodhart said the best way to keep them away from his wheat was to hang dead crows to sticks about the paddock. The common magpie was reported to be pulling up the young wheat, and also eating the grain from wheat heaps and open bags at harvest time. Jays were also doing a great amount of damage to the young crops. Mr. Schultz desired to know whether fallow would yield a more payable crop than land that had been ploughed after harvest, both being saturated with moisture at seeding time, and both receiving the same amount of seed and manure at the same time. Members favored fallow, because the action of the sun and air during the summer months would set free a large quantity of plant food and also sweeten the soil. The practice of burning stubble before ploughing came in for a good discussion. Members thought that unless land was being fallowed it was best to burn the stubble. The stubble left the land too open for a good seed bed. Instances were pointed out where this had been so. It was usually, though not always, best to burn before drilling stubble land. Canon Howard suggested that members should experiment with the idea of determining the value of harrowing growing crops.

Petina, July 19.

(Average annual rainfall, 13·19in.)

Present.—Messrs. W. Penna (chair), D. T. Kenny, W. Schultz, J. Bascombe, J. Souter, E. Keeley, J. H. Wharff, O. J. Howard (Hon. Sec.), and six visitors.

Breeding and Breaking Horses.—Mr. W. L. Schultz read a paper, in which he recommended farmers to breed good strong horses that could be readily sold. He thought the majority of mares in this district were on the small side, therefore it was advisable to select a good sized draught stallion for service. It was better to pay £5 for the use of a good sire than £1 or 30s. for the service of a mongrel. When castrating colts, it was advisable to avoid windy or frosty days. The animals should be roped as quietly as possible, and on no account should they be run round and made to sweat before the operation was performed. The ropes round the legs should not be tied too tightly, and the beasts should be kept down for as short a time as possible. He preferred the use of the searing iron and resin to the emasculator. The best time for castration was about August or September, when the animals were yearlings. Foals castrated at the age of 1 month seemed to get over the operation more quickly than those castrated at the age of 1 year. When breaking, it was advisable to secure the animal in a strong yard. A strong rope, with a slip-knot, should be run round its neck, the operator taking two turns around a strong post with the rope, and drawing the colt up. If it threw itself down, the person holding the rope should allow it to slacken gradually. A strong pair of winkers should then be put on, the bit being put into the mouth after the throat lash had been done up, and the animal then run round for a while, first in one direction, and then in the opposite. Following this, a collar and harness chains and a spider should be put on, a good steady horse being placed in front of the colt, a strong neck-rope on the latter being tied to the spreader on the chains of the former. One man should lead the horse, and one should be on each rope attached to the ring of the bit on the colt. After they had been run round for a while they should be attached to a small log, and after walking around with this for some time, the colt should be put straight into the wagon with a good team. Half a day's work without too great a load was sufficient for a start. After the collar was removed the shoulders should be washed with cold water. Members did not agree with the writer in that the big upstanding horse was the most suitable for this district. Mr. Wharff, some years ago, went in for large horses, but found them a failure. The small short-legged, large-bodied type of horse did as much work (because it was quicker), did not require as much feed, and was a much better doer in the paddock. The Hon. Secretary said the so-termed mongrel was the best horse for this district, providing he was well built. The Chairman drew attention to Mr. Kenny's horses. They were small, but drew heavy loads and kept in good condition although working hard. They were a very staunch lot. Mr. Kenny attributed this to the fact that they were all broken in to the buggy. Members did not agree that September was the correct month for castrating colts. Mr. Kenny and Mr. Penna, both of whom had had considerable experience, said that February and March constituted the best period. The colts were not so full-blooded and were not so likely to feel the effects; they would be about 18 months old at that time. Hot weather was the best in which to do the operation. They favored the emasculator, although Mr. Penna often used the knife alone.

Roberts and Verran, August 12.

Present.—Messrs. R. Johnson (chair), F. Masters, W. H. Whittaker, D. Hoar, C. Reiman, E. K. Phillips, H. Ede, J. A. Buttfield, W. Kunst, C. Kunst, A. T. Cowly, F. Imhoff, H. Sharman, and W. Sharman (Hon. Sec.).

Destroying Shoots.—Mr. W. Sharman read a paper, in which he advised early rolling of mallee, to allow the shoots to become well advanced before the time for burning arrived. A warm day, with a suitable wind, should be selected, and it would be found that a good burn would result in a better stubble for burning the following year. The sowing of oats was a good idea, as these carried the fire well. Land ploughed the first year generally produced fewer shoots than that disked. It was usually in the second year that the shoots were troublesome. If a running fire could not be secured the use of the fire rake should be resorted to. If knocked down the straw would be more destructive to the shoots when burning. The harrows could be used for this purpose, or in the absence of these the fire rake itself. A fire should go over all land, irrespective of whether it was to be cropped or not. For fallowing, the use of the disc implement was best. The sooner shoots were cut after seeding the better. Mr. Cowly had tried the grasscutter for cutting shoots, but there was trouble with loose sticks, &c., and it was necessary to go over the ground twice. Messrs. W. Sharman and W. H. Whittaker had tried fire-raking on fallow, but the ground, being loose, smothered the fire. Mr. J. McCallum favored the harrows for knocking down the straw. Mr. Phillips preferred the fire rake. The single-tooth implement was best. Members thought that if the fire rake were built higher it would carry a greater body of fire, which would be an advantage.

Shannon, August 9.

PRESENT.—Messrs. Proctor (chair), Wilkins, Inglis, C. and W. Wemyss, J. Carey, Fitzgerald, H. Roediger, and J. J. Cronin (Hon. Sec.).

FALLOWING.—The following paper was read by Mr. S. A. Wilkin :—" Fallow is essential where wheat-growing is to be made a success, for it is admitted by all successful farmers that the fallowed land gives better results than green or newly-ploughed land. It is also a great help in the way of getting the seeding over early, as it is possible to treat a much greater area with a cultivator than if the land had to be ploughed. Fallowing allows the rain, frost, and sun to penetrate the soil, which sweetens it. Ploughing to a depth of 3in. to 4in. will suit this district. The plough should not cut more than 7in. furrows, and all the draught possible should be kept on, to move the roots. All fallowing should be completed by the end of August or middle of September. It should then be harrowed and cultivated on the cross with a disc cultivator. This implement will cut a good number of the shoots, besides bringing the land to a fine tilth. One hundred acres put in crop this way would be worth 200 acres of stubble land. Grass land should be fallowed as soon as seeding is over and while the ground is wet, because these paddocks generally become firmly trampled down by the stock. Cut the holding into three parts ; for example, a farm of 900 acres should have 300 acres in crop, 300 acres under fallow, and 300 out for grazing. Sheep should always be run on the land which is intended for fallowing, as they keep down any weeds and manure the land to a certain extent. In some districts summer or autumn fallowing is a considerable advantage, but I do not think it would do for this district, as the land is too hard, and the stumps are too firm. The wetter the land the better. Late fallowing has a tendency to encourage takeall. Early fallowing and early working will starve out this disease, which is a very important point. It is a good plan to sow a little rape or turnips on the fallow where the crops have been affected with takeall. This will help to check the disease, besides providing a little summer feed for sheep." Mr. Carey would not fallow the land if the practice could possibly be avoided. If the stubble were fire-raked the shoots could be kept under for a year. Mr. Inglis would summer fallow. The Chairman thought there was more risk of takeall if the stubble were fallowed than if the land were left out for a year.

Utera Plains, July 19.

(Average annual rainfall, 12·06in.)

PRESENT.—Messrs. J. Abrook (chair), A. Venning, W. Gale, M. Abrook, W. Stephens, H. Rule, G. Barber, W. Lee, G. Hornhardt, H. Warnes, and A. Ramsey (Hon. Sec.).

SCIENCE AND THE FARM.—Mr. H. Rule contributed a paper, in which he drew attention to the dependence of the farmer on the work of the scientist. The present high standard of knowledge in matters relating to agriculture, he thought, was the result of careful scientific investigation, and the work of the scientist was complemented by the practical applications of his discoveries on the part of the farmer.

Utera Plains, August 16.

(Average annual rainfall, 12·06in.)

PRESENT.—Messrs. N. Guidera (chair), J. and M. Abrook, A. Venning, G. and H. Barber, W. Gale, J. Norton, G. Hornhardt, A. Ramsey (Hon. Sec.).

FEED AND WATER.—Mr. J. Abrook read a paper, as follows :—" The most pressing problem for farmers at the present time is feed and water for stock. If we get through the present drought it behoves everyone to see to it that at least two years' supply is stored up during good seasons to take us safely through dry times like the present. I do not suggest any combined action, but that every landholder should act for himself. Let us take ourselves to task and consider whether, if instead of passing 10 out of 30 years foraging for water, we had invested £100 in iron and timber, and constructed sheds and tanks, we should not be in a better way to-day. As far as one with a permanent supply is concerned, of course, the storage of water does not apply, but if the immense quantities of cocky chaff and straw that are annually burnt were stored up in a large shed one could always make it come into use in bad years. If not required by the owner it could be disposed of with advantage, and the shed would provide a catchment for water for household purposes, of which there is usually a shortage. If the harvester were fitted with an arrangement suitable for handling chaff I think it would be an advantage. One could keep it cleaner and better for using than if put through a stripper and threshing machine, that process giving too many backbones. The water supply is overtaken by the growing demand, whatever steps are taken. No surface catchment could give a sure supply of water at all times with a 12in. or 14in. annual rainfall. In the eastern end of this district the run would be only very occasional, the greater part of the fall putting nothing into the tanks or dams. Capital expended in galvanized iron catchments would be a much more economical investment than carting water at cost of about £1 per 1,000galls., which is, I think, a fair estimate of the cost. I would strongly advise anyone going on the land to make provision for an adequate water supply—not to muddle along anyhow." In discussing the paper, members said that where the amount of capital was limited, they would place iron on the ground to provide a catchment for water; otherwise, however, sheds, which could afterwards be used for the storage of implements, etc., should be erected.

Yabmana, August 9.

(Average annual rainfall, 15·14in.)

Present.—Messrs. M. K. Frost, G. G. Pengelley, J. F., G. G., and A. Robertson, W. Schirmier, J. H. and C. E. Frost, F. A. and A. Beinke, J. M. McCallum, H. P. McCallum (Hon. Sec.), and six visitors.

Care of Farm Horses.—Mr. J. H. Frost read a paper, as follows:—"Stabling is undoubtedly of first importance, for without a warm, comfortable stable a good percentage of the feed given to horses is practically wasted. When building a stable on the farm it is not necessary to incur a lot of expense. Timber suitable for the purpose can usually be procured without much trouble. Pine or gum will be found to stand for a number of years, provided a little care is exercised in its selection. A straw roof and iron or stone walls will be better than an iron roof; the former being cooler in summer and warmer in winter. The stable should open to the east. Feeding is of next importance, and should receive more attention and forethought than is generally given it. Regularity is everything; it should be the aim of every driver to feed his team at the same hour every day. Always water the horses before feeding, as they will then clean up their feed better. Avoid giving hay that is at all damaged or musty, as this is the cause of a good deal of the trouble with horses' health. When the drinking water is perfectly fresh it is well to place a few lumps of salt in the manger. On farms where a lot of horses are kept it is, perhaps, not practicable to groom them every morning, but it will be found labor well spent to clean them as often as possible. Always brush the shoulders before putting on the collar, as dry sweat is liable to cause a scald. When a horse gets a sore it should be well washed after the day's work, and some embrocation should be rubbed in. A bad fitting collar is more often than not the cause of sore shoulders." In the discussion which followed, members generally agreed with the views set forth in the paper. Mr. J. F. Robertson would water the team after feeding if they did not get a drink in the middle of the day. If the collars fitted the horses properly, and were stuffed and lined, when they became flat and hard there would be no trouble with sore shoulders. Mr. F. A. Beinke thought horses required three drinks a day, and would give these before meals. A straw stable was better than an iron one. The Chairman said watering horses was a matter of use; if they were watered before feeding they would always look for it.

Yadnarie, July 16.

(Average annual rainfall, 14·09in.)

Present.—Messrs. F. W. Dreckow (chair), W. L. Brown, G. A. Dreckow, J. A. Krüger, A. Spriggs, A. A. Jericho, R. H. Parbs, F. H. Stubing, J. J. Deer, F. G. Fitzgerald, A. Priess, S. H. Pearce, C. Dreckow, R. B. Deer (Hon. Sec.), and five visitors.

Fallowing.—In a paper on this subject, Mr. A. Priess said that as soon as the farmer had determined which paddocks he intended fallowing, he should put stock on these to keep the feed down. The fallowing should commence immediately after seeding, and the depth of the working should be regulated by the nature of the soil; loose limy soils requiring much shallower ploughing than hard clayey land. The light skim plough was the most suitable for shallow working. The harrows should be put over the land across the ploughing to encourage the germination of the seeds. The cultivation should not be done too early in the spring, or it might be found necessary to do the working twice, as the weeds would possibly grow again. These could well be kept down by sheep, which animals would also assist in solidifying the subsoil. With new land, however, especially in this district, less cultivation was required. If it were ploughed and left until the following autumn before cultivation, the sun would have a better opportunity for sweetening it, especially in the case of tussocky land. It was a good idea to skim over in the autumn land intended for fallowing, which would have the effect of burying weed seeds, possibly resulting in a good growth with the early rains. Members generally agreed with the ideas of the writer of the paper.

Yadnarie, August 15.

(Average annual rainfall, 14·09in.)

PRESENT.—Messrs. F. W. Dreckow (chair), W. L. Brown, J. A. Kruger, E. C. Kruger, A. Spriggs, A. A. Jericho, R. H. Parbs, L. H. Marston, F. H. Stubing, G. B. Kobelt, J. J. Deer, S. H. Pearce, C. Dreckow, and R. B. Deer (Hon. Sec.).

HARNESS.—Mr. J. A. Kruger read a paper on this subject. Harness, he said, was more generally knocked out than worn out. It should be thoroughly overhauled two or three times a year. Brown harness was more durable than black, on account of the fact that the latter was treated with a chemical dye, which removed much of the natural grease. The best process of cleaning was to take the harness to pieces and wash it well with warm water and soft soap. The inside faces should then be dressed with a thin coating of neatsfoot oil, whilst some harness dressing should be applied to the outside. Surplus oil should be carefully removed. Collars should be kept in the shade. Check lining was cheaper and cooler than leather, which was likely to scald the horse's shoulders. In the event of the appearance of sores on the shoulders the collar should be hammered with a bottle and eased. The draught of the hames, or the uneven length of the chains might be responsible. The paper was discussed at length.

Yallunda, August 23.

(Average annual rainfall, 18in. to 19in.)

PRESENT.—Messrs. F. Olsten (chair), R. B. Jenkins, G. Provis, T. V. Provis, W. Cabot, H. P. Cabot, T. Forrest, W. Forrest, M. Hissey, T. Allen, S. L. Dix, J. S. Perry, G. Gill, A. Price (Hon. Sec.), and two visitors.

AGRICULTURAL BUREAU.—Mr. H. P. Cabot read a paper, in which he urged on members the necessity for enthusiasm in connection with the Branch, and pointed out the benefits, both educational and social, which accrued from the meetings. They had the opportunity of securing advice from the experts of the Department of Agriculture. Whilst some persons had the idea that because they did not feel competent to contribute a paper or an address their attendance at meetings was not desirable, he pointed out that the interchange of ideas resulting from discussion on different matters of agricultural interest was of considerable value, and in this all could take part.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Bandon, August 1.

PRESENT.—Messrs. J. D. Lee (chair), W. Johns, W. Spurling, J. T. Retallack, G. G. White, R. Copp, P. Purdie, J. T. Corbett, H. Cope, jun., W. H. Spurling, M. J. Walsh, C. A. Evans, A. Dohse, L. Dohnt, W. Johns.

THE AGRICULTURAL BUREAU.—Mr. G. G. White contributed a paper, in which he urged on members the necessity for realising the responsibility involved in membership of this organisation. The object of the gatherings was the dissemination of knowledge on matters of agricultural importance, which would result in raising the standard of farming and enable them to avoid mistakes which had been made through inexperience in the past. Loyal support to the officers of the Branch was most important, and strong personal interest would ensure the success of the Branch.

Borrika, July 19.

Present.—Messrs. E. H. Huxtable (chair), R. Collins, N. Collins, L. G. Huxtable, J. Woods, J. L. Sandercock, A. E. Seary, J. H. Gray, G. Back, V. V. Brown, R. J. Stephens, J. E. Coombe, H. S. Green, H. Richards, C. W. B. Traeger (Hon. Sec.), and one visitor.

Colic.—Mr. E. H. Huxtable read a paper, in which he said that farmers should exercise considerable care when changing horses from grass to dry feed. There was a danger of colic, which trouble took two distinct forms, viz., spasmodic and flatulent. The former, if not promptly relieved, would in severe cases result in inflammation of the bowels, and the latter would show marked enlargement of the stomach, due to the generation of gas, which, if not checked, would probably have a fatal result. The general symptoms were—the animal became suddenly seized with pains in the bowels, restless, uneasy, adopted a crouching attitude, and, at times, struck at the stomach with a hind foot and gazed at the flank, exhibiting signs of great distress. After several efforts, generally it would be found to get down and roll about, sometimes on its back and frequently right over. The pain appeared to pass off quickly, and the animal again began feeding, but after an interval the symptoms returned with increased violence. The best treatment was to comfortably rug the beast and immediately administer the following drench:—Two ounces peppermint, 2ozs. sulphuric ether, 1oz. laudanum, and 1 pint of soft water. This should be thoroughly shaken and kept corked prior to administration If the animal were not relieved the drench should be repeated in about 45 minutes' time. In back country places, where drugs were not readily obtainable, it was advisable for the farmer to keep a small chest of medicine on hand, or, as a preventive, secure a few drenches from a reliable veterinary surgeon.

Borrika, August 16.

Present.—Messrs. E. H. Huxtable (chair), J. Waters, jun., J. Waters, sen., L. G, Huxtable, J. Woods, J. L. Sandercock, W. Mayfield, A. E. Seary, A. E. Hart, G. Stephens, V. V. Brown, J. B. Tonkin, R. J. Stephens, H. J. Stephens, H. S. Green, P. J. Marker. C. H. A. Tonkin, S. R. Haynes, F. Edwards, C. W. B. Traeger (Hon. Sec.), and two visitors.

Harvesting Machinery.—Mr. Gray read a paper, in which he said—"From the little experience I have had with harvesters in the North, I am of opinion that they are very little heavier to draw when the wheat-box is full than when empty. The reason is that the harvester carries the load on the near side of the main wheel, which is high and wide, and the load is also direct behind the horses. Being built on the off side of the main wheel there is a considerable amount of side-draught. This could be done away with by having the machinery built on the near side of the main wheel. The whole load would then be directly behind the team. This would mean a complete revision of the whole machinery. Taking all things into consideration, the stripper has advantages over the harvester in these parts. Harvesters draw heavily in sandy soil and over stumps. Wide strippers and a power winnower would suit the mallee farmers' requirements in harvesting his crop in the long run. It is better to do the threshing and cleaning at the heap than drag a small winnower around the paddock all day long. The farmer would then be able to save his cocky chaff for his stock in case of a dry season, such as we are experiencing at present. There is less tear and wear of machinery with this method. Purchasing a power winnower, of course, means a considerable outlay the first year, but this difficulty could be overcome by two or three settlers getting one machine between them. As these machines involve labor by this co-operation, this requirement could be obtained. In the case of power winnowers, with the engine on the same stand as the winnower, there is a certain amount of vibration; but on the other hand, when a portable engine is used, it means extra work when shifting, on account of change of wind or from heap to heap. There is an idea that a horse-power winnower has a detrimental effect on the legs and feet of horses which work in the treader. We have not found it so. By changing horses every hour and feeding them well they will put on condition during the cleaning. The motor power has advantages over the horse-power winnower. There is more power to deal with rough heady stuff, and the horses can be put to other work. The engine can also be used for chaffing hay and crushing corn. When a hand winnower is used it may be advisable to use damp weather strippers. The draught of these is greater than that of the ordinary strippers. A machine which works the thrasher with a direct drive, that is, by a separate belt from the main flywheel, will be lighter in draught than a thrasher which is driven by means of an intermediate pulley. With a direct drive the belts grip the pulleys well, and the machine can be driven with a comparatively slack belt. In regard to ordinary strippers, one requires durability and lightness of draught. To obtain this the machine needs to be built of light but strong material, and possess high and wide wheels; a long platform, or front carriage, so that the machine will run straight; medium size beaters, and an adjustable comb. There should be just sufficient comb over the off-wheel to clear the wheel. When the comb is set some distance out from the off-wheel there is a danger of catching the off-corner of the comb in stumps when stripping a low crop. Large beaters are heavier to drive, and a smaller beater is inclined to spit or spill wheat over the comb, so I would recommend a medium size. A machine with a 6ft. comb is a handy size. Larger or wider machines can be worked, but that means additional side-draught. The side-draught can be lessened by riveting aprons—curved strips of tin—to the roof of the machine, which will guide wheat to the near side. It is advisable to use a binder with a 6ft. cut, as it will work just as well as one with a 5ft. cut. The working depends largely on the driver."

Clanfield, August 16.

(Average annual rainfall, 16in. to 17in.)

Present.—Messrs. A. Richards (chair), W. Paull, A. Correll, A. Orwell, L. Orwell, H. Pavy, E. A. Pavy, C. Paul, W. J. Booth, G. Watson. P. Nelson, J. Nelson, A. G. Franklin, and H. Milne (Hon. Sec.).

Manurial Tests.—Most members were in favor of experimental manuring being undertaken by the department in this district, to be a guide to farmers who cannot afford to spend much on experimental work. Instead of only working on cleared land, it was thought a start should be made on newly-burnt land, and tests carried out that would be a help to the producers in this and similar country.

Claypan Bore, August 12.

(Average annual rainfall, 16in. to 17in.)

Present.—Messrs. J. Gray, S. Gray, E. Colwill, Horace Colwill, Harold Colwill, C. Hill, W. Webb, F. S. Tall, and five visitors.

Mixed Farming.—Mr. E. Colwill read a paper on mixed farming. Although this district was not yet thoroughly adapted to the keeping of large numbers of sheep, he said it would pay every farmer to keep from 50 to 100, both for household purposes and to keep the fallow free from weeds without too much working of the same. One sheep should return on the average £1 per year by producing the lamb, the fleece, and the mutton. *Cattle.*—This was not dairying country, but a few good cows for milk and butter supplies, with a surplus of butter for market, should be kept. For this purpose he recommended the Hereford-Shorthorn cross. The Shorthorn would give the milking qualities and the Hereford the beef. It was best to kill the calves and rear pigs with the separated milk. *Pigs.*—Pigs did well on warm separated milk. Only good breeding sows should be selected, and he favored the pure Berkshire breed. The progeny of these fattened and grew rapidly, the meat being of the finest quality. If the farmer desired to go in for a cross, he recommended the white Yorkshire sow, as this breed generally carried a large litter. They should be mated when 12 months old, and he considered it paid best to sell pigs just after weaning them. *Poultry.*—For poultry, clean and well protected houses and yards were necessary, because the birds must be protected from foxes. Although White Leghorns were the best layers, for farm purposes he would cross these with Black Spanish cockerels. Chicks should be raised as early as possible in the spring, so that they might be sufficiently advanced to withstand the heat of the summer, and start laying in the autumn. He preferred to rear turkeys and geese for table purposes rather than to breed heavy fowls. There was always an increasing demand for eggs. In the discussion which followed, the Chairman considered it a mistake to kill calves and rear pigs instead. A few weeks' feed and attention given a calf was all that was necessary. Without further trouble or expense a beast could be raised which at 2 years would be worth £5 or £6. Mr. J. Gray advised rearing high-class stock, and the constant endeavor to improve the quality of the herd. The Hon. Secretary preferred to purchase yearlings as stores, rather than to rear the calves. He recommended the Ayrshire-Jersey cross, as a fine-looking animal, capable of yielding large quantities of milk. Members all favored the pure Berkshire as the best all-round pig for the farm; but the Secretary said, if going in for a cross he preferred the Tamworth-Berkshire to any other. If the farmer provided a good straw bed for the pigs they did not require as much feed as if left to rough it. Wheat fed to pigs should be boiled or crushed. The Chairman preferred crushing to boiling. Mr. J. Gray did not recommend mating White Leghorns with Black Spanish, as suggested by Mr. E. Colwill, as both varieties were weak. He had found this district admirably adapted to the rearing of poultry, owing to the total absence of lice and tick, which he attributed to the presence of sand. The home of lice and tick was in the cracks in the woodwork of the roosts, but owing to the poultry carrying a certain amount of sand on their feet up on to the perch these cracks became filled with sand. Chicks hatched in August and September throve better than those brought out in October and November. Laying hens should not be allowed to fatten, as if so, a decrease in the number of eggs would soon follow. The fowls should be given plenty of work and be made to scratch amongst a heap of cocky chaff or straw for their corn. When using an incubator, great care should be taken to put same in a place where there was as little variation in temperature as possible. An ordinary "dug out" would be suitable. A good cross breed for the export trade was the Silver Wyandotte and the Silver Grey Dorking. Turkeys were good sitters, having been known to sit as long as three months and hatching three and even four sittings of eggs in this time.

Shoots.—To destroy shoots, the Chairman recommended cropping for three consecutive years and burning the stubble. With good burns each year the shoots at the end of this time would practically all be destroyed. To obtain early feed he advised running a disc cultivator over stubble previous to fallowing. This would cover most of the wheat wasted by the stripper, and given an early rain there would soon be ample greenfeed for grazing purposes. He emphasized the necessity of making provision for the feeding of stock in the event of a dry season. Oats mixed with cocky chaff would tide the stock over until the rains came. It would pay during a dry period to feed sheep at their present market value on hay worth £3 per ton in the stack.

Takeall.—Mr. L. McCormack (visitor) said dry fallowing of land of a loose flowing nature, after the second crop in new country, was the main source of takeall. The air would have too free access to the root of the plant in land of this class, and death would ensue. By fallowing land early and when in a wet condition there was practically no danger of the fungus ravaging the crop.

Coomandook August 16.

(Average annual rainfall, 18·01in.)

Present.—Messrs. Ninnis (chair), A. Bald, P. C. Potter, C. Mitchell, N. Brown, L. Crouch, H. Gosden, F. Byerlee, A. Bung, M. Wilkin, R. Williams, E. Luxmore, R. Byerlee, O. Blucher, L. Williams, and C. M. Wilkin (Hon. Sec.).

Question Box.—The meeting took the nature of a question evening, and a number of subjects of interest were dealt with. It was thought that three successive crops were sufficient to kill mallee shoots. After this the land should be fallowed or grazed. Applications of super. were advised as follows:—The first year, after a good burn, 56lbs.; second year, 70lbs.; and third year, 80lbs. to 90lbs. The skim working of a large acreage in this district was thought more profitable than close attention to a smaller area. The best varieties of wheat were Federation, Gluyas, Yandilla King, and Darts Imperial. Members thought the principle of the mallee shoot scorcher, which had been tried in the district, good, but improvement was necessary, as a machine on four set wheels would not turn satisfactorily in stumpy and sandy country. the wheels were in the case under notice set too low; four horses for a machine with a 6ft. cut were too many; and the sprocket chain was too light. A dobin was thought an unsuitable vehicle for general carting on the farm.

Coonalpyn, August 15.

(Average annual rainfall, 17·49in.)

Present.—Messrs. Gurner (chair), H. Bone, J. Hill, G. H. Wall, E. E. Williams, R. F. Venning, J. J. Cronin, A. H. Fidge, D. T. Cronin, F. J. Tregenza, G. E. Venning (Hon. Sec.), and six visitors.

Harvester *versus* Stripper.—Mr. J. J. Cronin read a paper on this subject. He thought the stripper more suitable for this district, on account of its lighter draught, the saving of the cocky chaff, and because there was less grain lost. He very much doubted whether the harvester would yield a good sample of wheat without the loss of a good deal of grain, when it was being worked on undulating country, especially if there were any wind. The cost of the stripper was much less than that of the harvester, and its life was much longer. However, there was a saving of labor with the latter machine at harvesting time, and under favorable conditions it might be made to last long enough to compensate for the extra cost. However, wheat left in the bags at harvest time was just as much liable to damage by thunderstorms as that in the heap. The reaper thresher was a slight improvement on the harvester, but it was too cumbersome and expensive to be useful to the majority of farmers. Mr. Wall favored the harvester on account of the saving of labor which it effected. Mr. Bone mentioned that mallee shoots caused trouble in the sample of grain when the harvester was used.

Lameroo, August 16.

(Average annual rainfall, 16·55in.)

Present.—Messrs. E. J. Trowbridge (chair), O'Connor, Leckie, J. H. and J. F. Jericho, J. Cameron, F. W. Eime, Ross, Mead, S. G. Trowbridge, A. J. A. Koch (Hon. Sec.), and one visitor.

Co-Operative Dairying.—The following paper was read by Mr. O'Connor:—"A creamery is of the greatest advantage in any community where a sufficient number of cows is kept within convenient distance for gathering the cream. The butter is generally of better quality, being made under the best conditions by one person who is an expert, and the quality is uniform, which is a most important factor, in so far as the marketing of the produce is concerned. The system of co-operative dairy-farming is not a new one by any means, and has been successfully carried on in various parts of the world, particularly in Denmark and Switzerland. It owes its origin to private enterprise, and the system is simplicity itself. The farmers in a district unite together, and form amongst themselves a society, with a view to sending their milk to one common establishment, there to be made into butter and cheese, the proceeds of which are divided amongst the members in proportion to the quantity of milk each has contributed. Under the conditions that exist throughout the greater part of the Pinnaroo district is seems feasible that a co-operative butter factory could be successfully carried on. At present, perhaps, the majority of farmers, on account of the vast amount of labor entailed in the clearing of their land, have little time to devote to dairying, but considering the special advantages this district seems to offer in many respects, I trust it will not be long before earnest consideration is given this question. In the first place there is abundance of water, and with a highly retentive subsoil and an average rainfall of somewhere about 16½in., there should be little to worry about concerning pasturage. We know from experience that the class of feed that grows in these districts is highly nutritious, and apart from the natural food that exists it has been proved by numerous experiments that various classes of fodder can be successfully grown. The farmer who depends upon wheat-growing alone is often the slave and victim of the adversities of season, weather, and markets, and it is inimical to his success to make use of his land for other purposes, apart from the entire cultivation and raising of crops for grain. The dairying industry is one that has made rapid strides during the last two decades, in fact, more so, perhaps, than any other branch of agricultural pursuits. Even in the north of South Australia, where wheat-growing has comparatively proved a failure, it is the dairying industry that has enabled the people to remain on their properties, and the regular proceeds from the sale of cream has been their chief means of providing for their requirements. I should think that the greatest and most effective development of the dairying industry in any district peculiarly suited for it would be through a co-operative system of disposing of the products. Under efficient management a co-operative creamery should prove a success. I have not, however, had an opportunity of going into figures, and merely make the statement with the view of inviting discussion and getting the opinion of some present who are thoroughly practical; but I know from experience in business that the farmers who had only a few cows seldom had large accounts to pay, and frequently had balances to their credit. Under co-operation every farmer who supplied cream would become a participator in the profits of the concern, and in such a large district as this it should not be long before the output of cream reaches large dimensions. In some parts of America, where co-operative creameries obtain a certain price for cream is fixed for the season, in accordance with the price of butter, and leaving a small fund in hand which is divided at the end of the season, or the price of cream is raised or lowered, according to market fluctuations. The creamery system is of general application, and may be made available both for the co-operative dairies and for large single dairies. Its greatest and most effective development, however, is through co-operation, by which a large number of farmers and small dairymen may enjoy its benefits. Generally, the dangers of co-operation with large business concerns are a lack of individuality and initiative. There is not the same incentive to economy and efficiency as is natural to the operations of a person who is working directly in his own interests, but in a comparatively small concern as a co-operative creamery in the Pinnaroo district, where the members would be almost in daily touch with the management, and frequent discussions as to necessary reforms or alteration in business methods could be held conveniently, there is not the same difficulty in this respect. In any co-operative concern it behoves the members to be loyal to the undertaking which they have helped to establish. Farmers in particular are a section of the community who should be able to co-operate with success. Their interests are identical, and anything they can do to improve the lot of their neighbor reflects also upon the whole population, as a generally successful comunity of farmers means better land values and better prices for commodities. The present system of Agricultural Bureaus is a true form of co-operation, farmers being prepared to expound for the benefit of their fellows the various results obtained from various styles of working." Mr. Kumnich thought this district, with its abundant water supply, well suited for this industry, and in years to come hoped to see farms split up and much dairying carried on. Practical experience had shown that where farmers had become members of these co-operative creameries they had invariably done well. Mr. F. W. Eime said natural grasses here did not produce much butter, but self-sown wheat and oats fed with a little chaff night and morning gave excellent results. If co-operation were started, all would need to feed alike. Regularity was most essential. The dairyman was courting disaster by missing a milking. It would pay farmers to always keep a good class of cow and cull out wasters. His cows were at present each making from 12lbs. to 14lbs. of butter per week. Mr. Townsend (visitor) said that years ago individual dairying was carried on in and around Mount Pleasant and Onkaparinga, and no headway was made. A co-operative butter factory was started; special feeding was adopted, and as a result, men who were once struggling were now well off. The Chairman was inclined to think that good milkers could be obtained from any breed if they were carefully selected. He believed in co-operation if it were worked on careful and economic lines.

Loxton South, August 14.

(Average annual rainfall, 12in. to 13in.)

Present.—Messrs. W. B. Russell (chair), A. J. Lowe, B. F. Beer, J. H. Beer, C. T. Durdin, C. Swinburne, E. Stokes, and A. J. Durdin (Hon. Sec.).

Clearing Mallee.—Mr. Russell stated that if mallee were cut between the months of April and August the shoots would get a good start before the scrub was burnt in February. The fire would kill these, and shoot-cutting would be obviated for the first year. This had been supported by experience on his own farm. Some members said that when they secured two good stubble burns hardly any green stumps were left to shoot.

Fencing.—It was pointed out that the hollow white mallee stood well for fencing posts, but red mallee succumbed to the attacks of white ants. Pine was generally favored for posts. They should be cut before the sap rose, and allowed to dry before being put into the ground.

Monarto South, August 16.

(Average annual rainfall, 14in. to 15in.)

Present.—Messrs. G. Patterson (chair), A. P. Braendler, R. E. Anders, J. Frahn, G. Gogol, A. and R. Hartmann, B. Hoff, A. Patterson, J. G. H., R., and G. Paech, A. Schenscher, B. and C. Thiele, E. Tilbrook, H. Zeunert, C. F. Altmann (Hon. Sec.), and six visitors.

Takeall.—Mr. A. Hartmann read a paper, in which he said, "In my opinion and experience takeall is a disease affecting various soils more or less. It is prevalent on light sandy soils, and worse on limestone and rubbly soils, but heavy stiff and clay soils are not so subject to it. I do not think it is a disease of the wheat plant itself, as it affects the plant more during wet seasons, with mild and cold temperatures during its growth, and seems to be disappearing in dry seasons. But I have noticed patches of takeall in dry seasons. There are several different stages during the growth of wheat when it may be attacked. I have seen a whole paddock affected three or four weeks after germination. The color of the plant shows a tinge of yellow, instead of being green, and the crop gradually dies off towards the maturing stage and in the warmer weather.

Sometimes when the wheat is about 12in. or 18in. high, patches from 3ft. to 30ft. in diameter of a yellow color will appear. These gradually extend week by week, until there is hardly anything left. The disease may not appear until after the flowering stage. Where patches of whiteheads appear, extending as the ripening process goes on, one will notice a good deal of pinched grain under the winnower. Some of the heads attain their normal size, but the grain either remains undeveloped or very much shrivelled. The straw and ears of such diseased plants present a bleached appearance. The plant proves to be dead, and the base of the straw and roots show a blackened appearance. Takeall will also affect oats, barley, and grass, but not to such an extent as wheat. All the varieties of wheat are more or less subject to the disease, but especially Federation. One will find insects resembling flies, but half the size, in large numbers, when the crop is ripe, wherever takeall appeared during winter and early spring. They are very troublesome to the horses and driver when stripping. Therefore, I conclude that the soil is diseased and is not in a fit state to grow crops when takeall is prevalent." Some members were of the opinion that oats were immune to takeall. A desire was expressed that other Branches should report as to whether small grey flies were to be found in numbers on patches affected with takeall.

Monteith, August 22.

(Average annual rainfall, 14in. to 15in.)

PRESENT.—Messrs. D. J. Travers, J. F. Connell, A. Clark, J. Ferries, T. S. Bradford, R. Magor, J. Rowan, sen., W. H. Carter, T. Kelly, A. A. Wells, O. E. Male, W. G. Gunn (Hon. Sec.), and six visitors.

BREAKING LIGHT HORSES.—In initiating a discussion on this subject, the Chairman advised first lassooing the animal, then hobbling both its hind and one fore feet together. A rope could be attached to the free foot, and, if necessary, a turn taken around the body to hold it up. He would lead the colt on horseback for six or seven miles and ride it the second day, using a good saddle and bridle, girth, two surcingles, and monkey straps attached to D's deep in the saddle. The animal should not be encouraged to buck, but good strong tackling should be used. Mr. Scott preferred educating the colt in a yard about four panels square with the aid of a whip. After 20 minutes at this he would put on a saddle and bridle and ride the animal in the yard ; it was well for the operator to be quite alone. Mr. Carter preferred roping the beast. Kindness and patience were essential. Mr. Male did not think the use of monkey straps advisable. The Hon. Secretary had noticed the following method adopted by a breaker :—First the colt was run into a stable with a quiet reliable horse. Hobbles were placed on the front feet and the animal allowed to walk about in the yard. The operator then approached the animal with a light stick. The horse was then mounted and the hobbles were removed. For harness education the animal could be put in a light trolley with a good reliable horse, and run for a few miles daily for five or six days.

Morgan, August 16.

(Average annual rainfall, 9·29in)

PRESENT.—Messrs. R. Wohling (chair), J. Pope, E. Hausler, H. Wohling, O. Hausler, J. B. Hoffman.

QUESTIONS.—For the destruction of green grubs in gardens Mr. E. Hausler recommended the use of one tablespoonful of coal tar in a gallon of cold water. Members generally preferred crossbred pigs. Mr. E. Hausler recommended the Berkshire-Essex cross for curing, on account of the tender quality of the flesh.

Parilla Well, July 25.

(Average annual rainfall, 16in. to 17in.)

PRESENT.—Messrs. R. Philbio (chair), J. E. and J. W. Johnston, D. B. and J. S. Ferguson, E. H. and H. Leak, T. Burford, F. and H. Nordhaussen, F. C. and A. Webster, J. Flavel, W. Flavel, and L. G. Neville (Hon. Sec.).

ROTATION OF CROPS.—The Hon. Secretary, in a paper on this subject, said the practice of alternating wheat and fallow had many points in its favor. Fallowing became much more easy, as the land did not become so hard, there was an absence of the numerous small shrubs which throve on sandy soils if left undisturbed, and usually a good stubble burn could be secured. The use of the plough, also, would not be necessary. If the land were worked up in the autumn, directly after the stubble was burnt, a larger amount of moisture would be conserved. It was questionable whether the third year rotation of fallow, crop, and grass would give profitable results in this district for some years, as sufficient herbage to sustain stock had not yet made its appearance. The sowing of oats or barley for feed in the place of allowing the land to lie out in grass, would overcome this drawback. Mr. J. W. Johnston thought most farmers in the district had more land than they could handle under the alternate wheat and fallow system. With the third year rotation it would be found that better results were obtained if the area under oats were left out for two years. Mr. J. E. Johnston thought the cultivator unsuitable for fallowing, as it did not pull stumps. Mr. J. S. Ferguson thought crops of wheat after oats might be tried with advantage. The Chairman thought good fires essential. A system he had noticed was wheat, grazing, fallow, and, although there was a tendency for the weeds to die out, little trouble was experienced with takeall. The plough was best for fallowing, as it weakened the roots of stumps.

Sheep.—At a previous meeting, in discussing this subject, Mr. J. E. Johnston said the increased growth of weeds in the district would make it necessary for farmers to keep sheep. Mr. J. W. Johnston thought these animals profitable, even if it were necessary to yard them. Mr. A. Inkster recommended the Shropshire-Merino ewe crossed with the Romney Marsh ram for lamb-breeding in this district.

Rabbits.—Mr. J. W. Johnston found the ploughing in of burrows the best means of coping with rabbits. Netting was essential to keep them back from breakwinds and scrubs adjacent to the farms, but the netting was liable to become covered with drift. Mr. A. Inkster agreed that the use of netting was essential.

Renmark, July 28.

(Average annual rainfall, 10·93in.)

Present.—Messrs. W. H. Waters (chair), J. S. Higgins, H. de Witte, H. S. Pike, M. B. Geneste, G. Agars, H. S. Taylor, H. D. Howie, H. B. Williams, J. N. McDougall, W. F. Snow, F. Cole (Acting Hon. Sec.), and two visitors.

Pruning.—In retailing impressions gathered during a recent visit to Mildura, Mr. H. S. Taylor exhaustively explained the long system of pruning which had been adopted by Mr. Sage, of the Wentworth Irrigation Settlement. He thought the exceptionally heavy crops secured by that gentleman were attributable to the system, and the trees were showing no signs of distress.

Sutherlands, August 16.

(Average annual rainfall, 10·60in.)

Present.—Messrs. J. Badge (chair), J. H. Geyer, Dohnt, Snell, Mibus, G. Heusler, Twartz (Hon. Sec.), and three visitors.

Sore Shoulders.—Mr. Badge read a short paper on this subject. A simple remedy recommended by Mr. Badge was a mixture of clean fat, or better still, pig lard with blacklead and powdered wattle-bark. With this mixture applied healing would take place, even though the horse was being worked. It was a mistake to cut a hole in the collar, for this caused a lump in the shoulder, and if the horse were sold, or a fresh collar put on, a new sore would be made at the old spot.

Wilkawatt, August 16.

(Average annual rainfall, 16in. to 17in.)

Present.—Messrs. D. F. Bowm n (chair), W. J. and D. Bowman, jun., J. W., F. W., E., and G. A. Altus, J. and A. V. Ivett, T. Sorrell, A. J. McAvaney, F. and B. Spackman, W. R. and M. Neville, H. H. Brooker, H. H. Pritchard, D. Horgan, B. Tylor, P. Gregurke, J. Wade, M. Hayes, W. J. Tylor (Hon. Sec.), and nine visitors.

Light Vehicles.—In a paper under this heading, Mr. D. Horgan said that when light vehicles were used in wet weather they should be washed and dried before being put away. If this were not done the wood work would swell, and dished wheels would be the result. A good coat of paint closed the grain of the wood, filled up cracks, and preserved the wood from the effects of the weather. Varnished wheels should be given one coat each of raw and boiled oil, and a good coat of varnish when they were thoroughly dry, every two years at least. The buggy was the most suitable vehicle for this district, as the four wheels stood the rough roads better than two wheels. Patent oil cap axles were advisable for sandy country. Hickory spokes were best; ironbark was not a suitable wood for this purpose.

SOUTH AND HILLS DISTRICT

Blackwood, August 11.

(Average annual rainfall, 27in. to 29in.)

Present.—Messrs. W. L. Summers (chair), E. and A. K. A. Ashby, Wilson, H. Sullivan, Sibley, A. W. Carlos, and A. A. Magarey, P. H. and D. Williams, Dall, Penno, Porter, Nicolle, Turner, Eglinton, Hunter, Winser, Hilfers, Davis, James, and Savage (Hon. Sec.).

Fertilisation of Fruit Tree Blossoms.—The following paper was read by the Chairman:—"It is hardly necessary for me to remind you that unless the blossoms on our fruit trees are fertilised we cannot have a crop of fruit, and, consequently, anything that lays within our power to assist the agencies which bring about this fertilisation, or to bring about conditions condusive to the same warrants our earnest attention. We know that it is necessary for the pollen to come into close contact with the pistil of the flower under suitable conditions to cause fertilisation, but it is remarkable how little we do know about the factors governing this act of nature. We know that some varieties are what is known as self-fertile, that is, their pollen is capable of fertilising their own flowers, while, on the other hand, some are self-sterile, that is, require the pollen of some other variety to bring about fertilisation. We are also told that the insects and the weather are important factors in this process, but what we lack is definite information concerning these points which we could put to practical use. How frequently do we find that trees blossom freely and yet set very little fruit; pears, citrus, and stone fruits might be quoted more particularly. Then do we not often get a better crop of fruit from what we might term a fair blossoming than from a heavy one? Then we have some varieties that we can depend upon to set the fruit if the blossom is there, and other kinds that we cannot. We often try to explain to ourselves why these things should be, and our views are often contradictory, for the simple reason that we are merely guessing at the causes. My object in dealing with this subject, which I admit I know little about, is to endeavor to awaken sufficient interest to induce growers to go to a little trouble during the coming season to note which varieties of trees blossom together, the weather conditions at blossoming time, whether insects, and especially bees, are busy amongst the flowers, whether any varieties set better than others in comparison to the amount of blossom, and if so, whether any local conditions exist which may account for this. If growers would take careful note of these points for a few years and publish the results through the Bureau meetings and the press, we would soon secure a great deal of local knowledge which would greatly assist in the object we all have in view, *i.e.*, the production of maximum crops. Not only does this question of the pollenation of the flowers directly affect the yields from our trees in the matter of numbers of fruit, but also in the matter of the size of the fruit. The Horticulturist of the Oregon Experimental Station, in reviewing the results of their work, states that it is interesting to note that the crossfertilised blossoms produced fruits containing more seeds than blossoms not crossfertilised, and, further, that the greater the number of seeds in individual fruits the larger the fruits. Fruits may mature and yet produce no seed, due apparently to imperfect fertilisation, but there is ample evidence that seed production in fruit is an exciting cause of growth. We have an instance of this in the Zante currant; the buck or seeded fruit is always much larger than the seedless or normal fruit. During the past few years I have been keeping notes of observations reported from various parts of the world in respect to this subject, and these notes form the basis for the views which follow. Reference to standard works on horticulture give one very little definite information, and suggest that the subject has not in former years received the attention it deserves. It is recognised that there may be many contributing causes to failure in the fertilisation of the blossoms. Of these the following are probably the most important:—*Weather Conditions.*—Unseasonable weather at the blossoming period, such as excessive heat or cold, heavy rains, hail, or frost have disastrous effects on the blossoms. Frosts and hail will also injure the fruit after fertilisation has taken place. Bearing on this phase of the subject the following summary of the results of observations made by Professor Sanderson, at the Wisconsin Agricultural Experimental Station, are very interesting :—' The vitality of pollen is not seriously affected by temperatures ranging from 25° to 55° C. in dry atmosphere. Temperatures under 25° seriously interfere with the germination. A temperature from 70° to 80° C. in a saturated atmosphere is fatal to the pollen of the peach, apple, and plum. At a temperature of 40° to 50° C., in a saturated atmosphere, the pollen burst open, due to the rapid inhibition of water, and the number of bursted pollen increased as the temperature increased. This bursting of pollen actually takes place in masses of apple and plum pollen during warm spring rains. Freezing temperatures ranging from 1·5° to 1° C. were not seriously injurious to the pollen of the apple, pear, and plum, while less than 50 per cent. of peach and apricot pollen were killed by this temperature. The pistils of the varieties named were more susceptible to the low temperature than pollen. Temperatures ranging from 1·5° to 0° C. kill the pistils. Sunshine has little or no effect on the germination of pollen, or upon the growth of the pollen tube in most plants. There was, however, a slight increase in the rate of growth in favor of sunshine. The germination and growth of the pollen of the tomato is decidedly retarded by cloudy weather, and also the anthers of the tomato require a certain amount of sunshine for the proper development of the pollen. The same is true in several species of lilium. The lack of culture and fertility in orchards greatly injures the production and fertility of pollen. The longevity of apple, pear, and plum pollen depends on the conditions in which it is kept. If kept in a dry place in a temperature ranging from 7° to 26° C., apple pollen can be kept for six months or longer, while few plum pollen germinated after being kept for six months. Pollen may safely be shipped from one part of the country to another without losing viability or fertility. Under favorable conditions it requires nine to 32 hours for the pollen tube of apples, plums, and cherries to reach the ovary when placed on the stigma or in the germinating medium. Cherry pollen requires a little over 12 hours. Under natural conditions the time required would be somewhat greater since the rate of growth is increased with the increased temperature up to the optimum degree which, in the case of apple, pear, and plum pollen, is 24° C. This would indicate that the length of time required for the germination is considerably less than is commonly believed. Two or three bright warm days at the time of full bloom is sufficient for the setting of fruit. The stigma of apple pollen are receptive from four to six days, whether pollinated or not. Continuous rainy weather for six days would probably result in total failure of the crop. The factors which affect the fertility and production of pollen, over which the orchardist has control, may be briefly stated as follows :—Suitable site, location of soil, pruning and spraying, proper planting, cultivation, sufficient amount of plant food, selection of suitable varieties propagated from bearing trees, and the planting of several varieties which flower at about the same time, to insure proper fertilisation. The factors over which the orchardist has little or no control are : freezing temperature, which may kill the pistil or the pollen, especially before the latter are ripe, or both ; continuous rain during full bloom of the orchard ; high temperature with a large amount of moisture and absence of wind, which causes much pollen to burst at the time of germination ; and absence of insects and wind at the time of full bloom. In endeavoring to trace the amount of injury due to unseasonable weather conditions, we must have some definite knowledge of the periods over which the different varieties bloom in the different districts, as well as of the weather conditions of the district, if we are to minimise loss from this cause. *The Vigor of the Tree.*—Pollination may fail, owing to the excessive vigor or excessive weakness of the tree. The farmer may be counteracted by taking such action as may be necessary to reduce the tree to normal growth ; the latter better cultivation, drainage, manuring, or irrigation, according to circumstances. Excessive blossoming also appears to have a disastrous effect, and, in some instances good results have been obtained, especially with pears, by thinning out the spurs, removing weak ones, and reducing the others where considered desirable. If we examine any branch on a healthy mature pear tree and count the spurs we will find that if each spur mature one pear it would be far more than the branch could carry. As, however, each spur will throw many blossoms the need for judicious thinning is apparent. *Insects and Diseases.*—Fungus diseases exercise a destructive influence on the blossoms, but, fortunately, the grower can materially lessen, if not prevent, loss from this cause. Pears in particular are subject to such injury, and it is recommended to spray with Bordeaux or Burgundy mixture when the buds are just coming out of the spur, but before the blossoms open. This will not only assist in the setting of the fruit, but will also prevent to a large extent injury to the newly set fruit which causes malformation. Some varieties, and the Glou Morceau may be mentioned, are particularly subject to this trouble, even in this district, where there is not as a rule much loss from fusicladium injury. In apricots we have a good deal of loss of blossoms from what is usually called 'black bud.' This appears to be due to the attack of shothole or other fungus late in the autumn, and autumn spraying is recommended wherever it is prevalent. Insects exercise both injurious and beneficial effects, according to the nature of the insects. Thrip and red spider are injurious, but preventive measures are at the disposal of the grower. Other insects which visit the flowers to gather pollen and honey do an important work for the grower, as they carry pollen from one flower to another on their bodies. It is, however, a much disputed point as to whether these insects actually cause the fertilisation of as large a proportion of the blooms as is frequently claimed. In a report issued by the Oregon Agricultural Experiment Station, the Horticultural Expert states that probably 99 per cent. of the fertilisation of the blossom is due to insects, and that bees are the most important of these. At the Oregon station the peach trees which were screened to prevent bees and other insects obtaining access to the flowers, set a fair quantity of fruit, but most of it fell at the stoning period, whereas those trees adjoining to which the bees had access matured abundant crops. At Kansas, the results of a similar test with a number of varieties of trees was the same. In Colorado, a leading horticultural writer states that the setting of fruit in that locality is in proportion as the bees are numerous or scarce. In California, repeated instances are given of orchards formerly yielding sparse crops giving good returns when a number of hives of bees have been brought into or adjoining them. In the United States Department of Agriculture Year Book, M. B. Waite emphasises the value of bees, and says 'Be sure there are sufficient bees in the neighborhood to visit all the blooms, and where possible encourage the bees to visit the orchard by planting in a warm sheltered spot, or by planting windbreaks.' On the other hand, a grower in New South Wales, speaking on this subject, stated that he believed that the value of bees had been greatly over-rated, as he always had plenty in his orchard (of Jonathan and Sturmer apples), but had a poor setting of fruit, except in the rows where the two varieties were in close proximity to each other. He points out that a bee will obtain all the pollen it will carry at one trip on visiting 80 to 100 flowers, so that the number of bees required to fertilise the blossoms in a large orchard would be enormous. Other authorities are also inclined to doubt whether bees play anything like such an important point as the wind in carrying the pollen from one blossom to another. If the bees are as important a factor as generally suggested it is easy to see that indirectly the weather plays a very important role as mild sunny days at the blooming season will render the bees, &c., active while gloomy cold weather will keep them in the hives. *Lack of Other Varieties of Trees.*—Here we have a most interesting phase of this question, and one that, if it is as important as most observers are inclined to believe, is quite within the control of the grower. It is well known that the planting of large blocks of one variety frequently results in disaster, and numerous instances could be quoted where success has followed the grafting over to some other variety flowering at the same time of a percentage of the trees. The grower should ascertain what varieties flower at the same period, and we can all help by keeping records. The records being kept in the Government orchard will be of great value in a few years, but they cannot be relied upon entirely as the relative periods of blossoming of different varieties vary in different situations. We also want to determine by actual records what varieties are self-fertile and what self-sterile, or partially so. Curiously enough, even this appears to vary in different districts. The Williams, or Duchess pear, as we know it, is regarded as more or less self-sterile in the Eastern States of America and in Australia, yet in California, under the name of Bartlett, it is quite self-fertile, and is planted in solid blocks of many acres in area. Then, again, Beurre Clairgeau, Gansels' Bergamot, L'Bonne de Jersey, Winter Nelis are more or less self-sterile in Eastern America, whereas Clairgeau and Louis Bonne de Jersey are considered self-fertile in other parts. The Howell is regarded as self-fertile in California and the reverse in Australia. We have these same differences with apples. It will be seen from the foregoing how important it is that we should know what varieties bloom about the same period, and I would strongly urge members to make note of this. What we want to know is (*a*) when the first blooms are out, (*b*) when the tree is practically in full bloom, and (*c*) when the bloom is off. With (*a*) and (*c*) this does not mean when the very first bloom is out or the last, but when there are a reasonable number of normal blossoms out. Before dealing with one of the most important aspects of this question, from the practical point of view, *i.e.*, interplanting varieties; I have some notes gathered from different sources in respect to apples and pears—time does not permit of going further—dealing only with the leading varieties. *Apples.*—Jonathan and Cleopatra flower with Newtown, Prince Alfred, Red Astrachan, Reinette du Canada, Strawberry Pippin, Williams' Favorite Rokewood, Yates' Statesman. The Yates is considered one of the best to fertilise the Jonathan, but its lateness in maturing is an objection which will be referred to later. Dunn's Seedling and Spitzenburg flower with Emporer Alexander, Garibaldi, Irish Peach, Bismarck, Ribston Pippin. London Pippin and Rome Beauty flower with Adams' Pearmain, Buncombe Delicious, Hoaves, Lord Wolseley, Nickajack, Northern Spry, Winter Magetin. *Pears.*—Records at Burnley, Victoria, showed that in 1910. 300 out of 347 varieties of pears were in bloom between September 27th and 29th, but this was abnormal, and was attributed to excessive warmth at that period, hastening the blossoming of the later varieties. The average period of blossoming was about 16 to 19 days, according to the season. The Keiffers, Gansels' Bergamot, and Winter Nelis appear most self-sterile, Williams' Bon Chretien coming next. In regard to flowering, Williams' Bon Chretien flowers at practically the same time as B. de Capiamont, Josephine de Malines, Duchess D'Anjou, Madame Cole, Glou Morceau. Kieffer blooms with Le Coute, Harrington's Victoria, Doyenne du Comice, Broom Park, Howell, Duchess de Angoulime. Gansels' Bergamot blooms with B. Diel, Glou Morceau, and Winter Nelis. Winter Nelis blooms with Gansels, B. Beurre Diel, Seckle, Vicar of Winkfield, and Easter Beurre. It must be understood that the above is only a partial list, that is the result of only two years' records, and being for one locality only will probably not apply in every district and in every season. *Interplanting of Varieties.*—All authorities are now agreed that unless a variety is known to be perfectly self-fertile in a particular district it is unwise to plant large blocks of trees of that variety. Even in such instances interplanting is considered advantageous, and three or four row blocks of one kind are considered best. In planting the different varieties it is advisable to have the rows run across the direction of the prevailing winds at the blossoming period. In deciding what varieties to plant together we must know which bloom at the same period, and other things being equal, select varieties that ripen fairly close together. Avoid planting an early and a late maturing variety in alternate rows for the reason that the traffic in harvesting the early variety will consolidate the surface soil with the probable result that the later kind will suffer from lack of moisture. Examples of undesirable extremes, where the question of moisture is of importance, are Jonathan and Yates in apples, Williams' Bon Chretien and Glou Morceau in pears."

Cherry Gardens, August 12.

(Average annual rainfall, 35·03in.)

Present.—Messrs. H. Jacobs (chair), J. Lewis, G. Hicks, T. Jacobs, sen., J. Tozer, S. W. Chapman, H. Lewis, A. Broadbent, T. Jacobs, jun., A. R. Stone (Hon. Sec.), and three visitors.

Rabbit Destruction.—An instructive paper under this head was read by Mr. T. Jacobs, jun. The writer contended that the rapid increase of the rodent in the district called for serious attention of landholders. Not only did they attack crops, but orchards, and especially young trees, were very frequently damaged. They were also of considerable trouble in the vegetable gardens, and vineyards also received their unwelcome attention. Especially were they destructive in the case of muscatelle vines, the leaves of which they ate before the fruit had matured, with the result that the crop failed to ripen. Another cause of annoyance had been the undermining of roads by the burrows. The writer was of the opinion that systematic and simultaneous action on the part of landholders would result in their eradication. Wire netting was a great advantage. The first step in the direction of destroying the pests was to keep them out of the ground by digging out or blocking up their burrows. Continuing, he said—"Fill each opening as tightly as possible with titree, bracken, or any shrub that is handy, and cover up with earth or stones. Some of these may be reopened, but care should be taken to prevent the rabbits taking possession again. Destroy any new burrows that may be commenced as soon as discovered. In rocky places it will be found most difficult to deal with the holes. In such cases it is best to block every hole possible, and set traps around the remainder. Where the rabbits are thick it is necessary to poison them. Commence this when the feed is dry and scarce. Care should be taken to use only the poison that is least dangerous to stock. After they have been reduced considerably by this means and grow too wary for baits, the remainder can be killed with dogs and guns. Some might say this is too expensive, but it is one of the quickest and most effective ways of destroying the pest, especially where they are only scattered. Besides, there are only three or four months in the year when the skins do not pay for the cartridges used, and it is evident that we cannot eradicate the pest without considerable expense, whatever means we use. Get rid of all thickets of every description that are likely to harbor the rabbits. It is surprising the number that two or three dogs kill in a year. Practically no young ones escape, and I venture to say it would only be but a matter of two or three years when we would have the satisfaction of having the district quite free of the pest." In discussing the subject, Mr. Hicks mentioned that he had had good results from placing pieces of newspapers in the mouths of the burrows. The rabbits seemed to dislike scratching on anything noisy. Mr. T. Jacobs, sen., thought scrub, titree, and ferns efficient for blocking burrows. Mr. J. Tozer said the closing of all holes for a period of 48 hours would destroy all rabbits inside. The holes were usually reopened from the outside. The exploding of dynamite in burrows situated in rocky places not only wrecked them, but filled the passages with poisonous fumes.

Clarendon, August 11.

(Average annual rainfall, 33·67in.)

Present.—Messrs. T. B. Brooks (chair), H. C. Harper, J. Spencer, C. C. Spencer, W. A. Morphett, L. Masters, J. Piggott, A. L. Morphett, A. Harper, A. A. Harper, J. Potter, J. R. Nicolle, E. Dunmill, L. Spencer, H. Rowley, A. Phelps (Hon. Sec.), and two visitors.

Fruit-Growing.—Mr. A. L. Morphett read a paper, in which he stated that within a radius of a few miles of Clarendon there were hundreds of acres of land suitable for fruitgrowing. Apples did extremely well in the valleys and on the hillsides. In Tasmania, as much as £30 per acre was paid for similar country, and the cost of clearing for planting in many instances involved another £30. The average annual income from an acre of apples, established in bearing, should equal £25, and 16 acres should provide a good living for a family. The difficulty was that for six years there would be no return, whilst for a further three years or so the returns would only repay the cost of upkeep, &c. The prospective orchardist should procure the most up-to-date labor-saving machinery and implements, and pay careful attention to the selection of the trees. Members generally

Forest Range, July 17.

(Average annual rainfall, 35in. to 36in.)

Present.—Messrs. W. McLaren (chair), C. Dolman, E. and F. Rowley, W. Tribe, A. and F. Green, E. Dearman, H. Sass, E. Green (Hon. Sec.), and two visitors.

Poultry in the Orchard.—Mr. W. Tribe read a paper on this subject. The continuous decrease in the numbers of native birds, chiefly insectivorous, he said, had allowed an appreciable increase in insect life. When poultry were kept in orchards they assisted in keeping these pests in check. The droppings of the birds were of considerable manurial value, and fruit which fell to the ground, and which would otherwise remain as a harbor for pests, would be readily eaten by the birds. Where they were likely to do damage to the smaller fruits or vegetables, either these could be enclosed with wire netting or the birds could be confined in movable pens. The sale of eggs and birds should return sufficient to at least recoup all expenses, after the requirements of the household had been supplied. At the prices ruling at present there should be a fair profit in keeping the fowls. The heavier breeds were preferable, for whilst the Leghorns were best for egg production they were difficult to confine. Mr. F. Rowley thought poultry profitable if they were well looked after. Silver Wyandottes were best for this district. Mr. F. Green thought this locality too cold for egg production. Mr. E. Rowley favored yards of from three to four acres in extent with portable houses. He preferred White Leghorns, a good strain being essential. Mr. E. Green thought fowls too great a nuisance in the orchard, and they did not diminish the insect pests to any appreciable extent.

Forest Range, August 14.

(Average annual rainfall, 35in. to 36in.)

Present.—Messrs. J. Green (chair), W. McLaren, J. Vickers, E. Rowley, A. and F. Green, R. Collins, C. Dolman, H. Schultz, H. Trevenen, E. J. Green (Hon. Sec.), and two visitors.

Pruning Apples.—Mr. A. Green thought it advisable to prune old apple trees the year prior to an anticipated good crop, or directly after a full crop. Mr. Schultz preferred to prune the trees regularly each year. Mr. J. Green pruned his trees lightly in an off season, but heavily when a full crop was expected, and satisfactory results had been secured. Mr. Vickers thought an off season the best time to prune an old tree, but heavy pruning of healthy trees in an off year resulted in the growth of large quantities of wood, but little fruit. Mr. F. Green preferred heavy pruning the year previous to large crops. Mr. J. Green had cinctured about one-sixth of a Nickajack apple tree; this portion carried a nice crop of fruit, but the untreated part bore practically none. Members agreed that deep planting of fruit trees was not advisable in this district.

Hartley, August 13.

(Average annual rainfall, 15in. to 16in.)

Present.—Messrs. B. Wundersitz (chair), S. Beavis, S. Pratt, C. Klenke, G. Hill, G. Phillips, W. Cross, D. Clark, B. Klaebsch, P. Wagenhaccht, A. Wundersitz, T. Phillips, W. Bermingham, J. M. Hudd, D. F. Westwood, J. T. Forbes, J. Hudd, F. Lehmann, J. Stanton (Hon. Sec.), and two visitors.

Working a Farm of 500 Acres.—Six members read papers on this subject.

Mr. F. Lehmann said that as about two-thirds of the district was good arable land, and the balance good grazing country, with a three years' rotation on an average farm of 500 acres about 110 acres could be cropped, 80 acres fallowed, and 310 acres grazed. Six horses should be sufficient for the work, and two of these could be of the roadster type. Two foals could be reared yearly. The stock could also include 10 milking cows, two sows, about 150 sheep, and 150 head of poultry. The income would approximate from 110 acres wheat and hay, £150 (after horse feed, hay, seed, and fowl and pig feed had been deducted); 150 sheep, lambs, and wool, £110; butter, £70; poultry, £70; pigs, £20; sale of cattle and horses reared, £40; a total of £460.

Mr. W. Bermingham recommended that the homestead should be placed on rising ground in the centre of the holding. About 150 acres should be fallowed as early after seeding as possible to a depth of 5in., if the soil were stiff, but to a less depth in lighter soils. A harrow could with advantage be attached to the plough. The ground should be cultivated to a fair depth during September, and harrowed or cultivated after summer rains. At seeding it should be again cultivated to a depth of 2in. Weeds should be fed-off with sheep. A light harrow could be attached to the drill. Plenty of hay should always be on hand. The harvester was better than the stripper. All the animals should be well fed.

Mr. J. M. Hudd advised dividing the area into three paddocks of 150 acres each, three of 5 acres, 20 acres being allowed for waste land, and 5 acres for the homestead. Suitable sheds for machinery should be provided, and fruit, vegetables, and flowers should be grown. The three small paddocks could be sown to barley, rape, lucerne, maize, &c., for feeding purposes. The returns should be from the garden, £10; 600 bags of wheat at 10s., £300; 360 bags oats at 3s. 6d., £99; 50 sheep, wool at 6s., £15; 40 lambs, wool at 8s., £16; eight cows, 1,680lbs. butter at 9d., £63; sale of eight cows, £12; pigs, £20; two horses, £40; poultry, 1,600doz. eggs at 8d., £53 6s. 8d.; geese and roosters, £10; a total of £638 6s. 8d. In addition to this, 30 tons of hay and 20 tons pea straw should be produced. Expenditure would include 6 tons manure, £25 10s.; seed wheat, 40 bags, £20; oat seed, £4 2s. 6d.; pea seed, £5; other seeds, £5; wheat for fowls, £12 10s.; wages, one man at 25s. per week, £65; a total of £137.

Mr. B. Wundersitz would crop 150 acres with wheat, 10 or 15 acres with oats, fallow 150 acres, and graze 150 acres. The remaining area could be used for lucerne, permanent grass, or orchard, according to the circumstances. The stock should include five working horses, one lighter animal, six or eight milking cows, a few pigs, 25 ration sheep, and 100 or 200 fowls. Overstocking, however, should be avoided.

Mr. G. Hill would enclose the area with a fence consisting of posts 5yds. apart, with five plain wires, and one barbed wire on top. He would then divide it into three 150-acre paddocks, 50 acres being left for grass, timber, &c. Buildings should consist of a homestead, a galvanized iron barn, stable of timber and straw for seven horses, and a galvanized iron shed for implements. A 5-ton wagon, 6ft. damp weather stripper, winnower with elevator and transport, 15-disc drill, five-furrow stump-jump plough, six harrows, one heavy and one light dray, binder, horse rake, engine, chaffcutter, and a buggy would be required. One hundred and fifty acres could be cropped with wheat annually, 120 acres should be fallowed, 20 acres sown to oats, and 10 acres to peas, the third paddock being left for grazing; 150 sheep, seven dairy cows, two breeding sows, 100 fowls, in addition to two ponies and three or four foals, which could be bred annually, and heifer calves from the best of the cows could also be kept. Water should be provided in every paddock. The only outside labor required would be for winnowing, and the sale of cocky chaff should return sufficient to pay the wages.

Mr. S. Beavis assumed that the farm in question was situated on the right bank of the River Murray, between Mannum and Murray Bridge, with a river frontage of about 70 chains. Suitable trees for shelter should be left in the corners of the paddocks. Walls and rafters of cow sheds, stables, pig styes, &c., could be made from split butts of pines. The site for the homestead should be very carefully selected. A large underground tank, a 30ft. or 40ft. well, and windmill should be adjacent. While irrigation from the river, where there were high cliffs, was practically impossible without a powerful pumping plant, the low-lying lagoons, or billabongs, were extremely fertile. About 3 acres of the farm should be planted to fruit trees, vines, and vegetables, mangold wurzels, &c. Alongside, an area of about 20 acres could be fenced, and on this two or three good Alderney cows and a hack and buggy horse could be run. Four paddocks of 100 acres should be fenced. Two of these should be cropped each year, and two cropped and fallowed alternately; on these 100 good sheep could be kept. An average return of 16bush. per acre could be expected, which would sell for £530; 100 sheep should return £30; eggs and surplus dairy produce, £40; a total of £600. Of the remaining area 10 or 12 acres should be sown for hay, and 70 acres used for paddocking the draught stock. The net income should be about £500 annually.

Ironbank, August 16.

(Average annual rainfall, 33in. to 34in.)

PRESENT.—Messrs. C. Morgan (chair), R. Coats, W. Slater, E. Coats, W. Coats (Hon. Sec.), and four visitors.

STRAWBERRIES.—With regard to replanting land with strawberries, Mr. C. Morgan recommended breaking up the land and planting it with field peas after the first plants died out. The next year the soil could be cultivated and manured, and strawberries again planted. He had tried this four years ago, and the results had been satisfactory.

Kanmantoo, August 9.

(Average annual rainfall, 17·90in.)

PRESENT.—Messrs. T. Critchley (chair), T. Mills, H. Downing, E. Shepherd, A. Mills, R. Critchley, A. Stewart, W. C. Mills, W. Downing, R. Talbot, W. G. Johncock, H. R. Shepherd (Hon. Sec.), and one visitor.

POULTRY.—Mr. W. G. Johncock read a paper, from which the following is taken:—"I have kept Minorcas, Brown Leghorns, White Leghorns, Silver and White Wyandottes, Black Spanish, and Buff Orpingtons. My experience has been that the White Leghorns are the best layers, and that for an all-round fowl the Silver Wyandottes are the best of those I have tried. The White Leghorn is very hardy and the chickens are not hard to rear. They grow and mature early, and will commence laying at from five to six months old without forcing. I favor hatching chicks, if possible, in the months of July, August, and September. Unless hatched very late, pullets always, or nearly so, go through a light moult at the usual moulting time, in February or March. If hatched during the months I have named they moult at the usual time, and, being young, with proper attention, recover from the moult and commence to lay again before the wet and cold weather sets in, and will, in most cases, lay right through the winter, when eggs are at the top market value. Always keep the pure blood of any breed that is fancied. If one already has the old barndoor fowl, my advice is to change them as soon as possible, no matter whether one intends keeping six or 60. It is a mistake to think that by having a pure-bred rooster in the yard one can breed up a strain of first-class fowls, for while the stock might be improved, it will be a slow process to get them up to the standard of the best fowls of to-day. Purchase a cockerel and five or six second-year hens from a reliable breeder. Both male and female should be of medium size. The male bird should be bold, vigorous, and full of life, and have a bright red fiery eye. Avoid a bird with a light-colored eye if possible. It should not have too much comb, but the comb should stand erect. Good clean legs, free from any sign of scale, should be looked for. The hens should have fine bright red combs and wattles, red eyes, and good clean legs. The body of the bird should be well balanced, heaviest at the back for preference. The shoulders should be wide and taper back to the tail. I favor the Silver Wyandottes for a second strain, because they, as a rule, are good winter layers, providing they are not kept until too old. It is necessary to have some pullets every year to replace the old stock. I have found the Silver Wyandottes payable for winter laying. As the warm weather comes along they go broody. They are very quiet when sitting and can be placed on a nest anywhere, and removed so that the eggs can be tested. They are also a good table bird. The young male birds sell well, and if fed well, are fit for market at about five months old. One disadvantage, in many cases with the Silver Wyandotte hens, is that they leave their chicks too young. I have had them start to lay again after hatching when their chicks have been a month old. The food of the laying hen should be of the best. Where fowls are allowed to run over an area, as they are on most farms, two feeds a day are sufficient, as they pick up food about haystacks or where stock are fed. Bran mash, consisting of about two parts bran and one part pollard, mixed with the gravy from some boiled meat, could be given in the morning. Gravy from the carcass of the rabbit serves the purpose splendidly, as does also the meat itself well boiled. Give this two or three times a week. The hens do well on milk given in moderation. My experience with the other breeds mentioned has not been so favorable as with the White Leghorns and the Silver Wyandottes. The Minorcas and Black Spanish are fair layers, and produce fine large eggs, but a good White Leghorn hen will lay 30 per cent. more eggs as a rule. The Brown Leghorns are fair layers, but are not equal to the Whites. The Buff Orpingtons are the worst fowls I have ever had any experience with. Sell the hens just before they moult after they are two years old. Mark each season's chicks with a web punch, or aluminium rings for the legs. I am thoroughly convinced that poultry will amply repay any trouble, and that with proper care and attention they are a valuable asset to the farmer. For several years we have been selling wheat at 3s. 6d. to 4s. per bushel, and I have proved that that which I have fed to poultry has returned me 7s. to 8s. per bushel." Members thought sulphur and kerosine the best remedy for scaly legs.

MacGillivray, August 12.

(Average annual rainfall, 19in. to 20in.)

Present.—Messrs. R. Wheaton (chair), H. Ayris, D. Lade, A. J. Nicholls, H. E. Petras, A. Stirling, jun., A. Sands, H. J. Wiadrowski, H. C. Williams (Hon. Sec.), and one visitor.

Trolly Wheels and Tyres.—In a short paper on this subject, Mr. Stirling stated that he had placed the hind wheels of his trolly on the front axles and put still larger wheels on the back axles, thus raising the vehicle 4in. He considered that this alteration reduced the draught by about one ton. Tyres 4in. and 4½in. in width were quite sufficient for the roads in this district, and he thought that the vehicle with tyres of this width, when loaded to its full capacity allowed by the "Width of Tyres Act," would provide a heavier load than could be comfortably drawn over sandy roads. For use in the sandy country in the interior, Mr. Ayris had found the 7ft. wheel with a 6in. or 7in. tyre the most suitable. Mr. Nicholls favored wide tyres with relatively light felloes. It was an advantage to have the latter convex if carting were being done in sandy country, as this enabled the wheel to free itself better. The Chairman thought that whilst the wide tyres were most suitable on softer tracks, they were considerably more trouble than the narrow tyres amongst stumps.

Meadows, August 11.

(Average annual rainfall, 35·52in.)

Present.—Messrs. G. Ellis (chair), T. B. Brooks, J. Stone, J. Catt, F. Nottage, N. A. Kleemann, W. Phillips, J. N. Williams, E. W. Vickery, G. T. Griggs, F. W. Vickery, A. Y. Ellis, W. J. Stone, S. Smith (Hon. Sec.), and one visitor.

Natural Remedies.—Mr. G. T. Griggs contributed an interesting paper, in which he dealt at length with the value of fresh air, healthful exercise, and temperate habits with reference to feeding, both in man and beast. He touched on many entertaining reminiscences of life on the land in the early days of the State.

Meningie, August 16.

(Average annual rainfall, 18·87in.)

Present.—Messrs. W. H. Mincham (chair), G. Hastings, A. Ayers, T. W. R. Hiscock, R. M. Scott, F. R. Deane, S. Yates, F. W. Newson, H. N. Mincham, L. D. Martin, A. A. Pettet, W. M. Wright (Hon. Sec.), and four visitors.

Colt-Breaking.—In a paper on this subject, Mr. F. W. Newson said the best method of handling a colt was to get the animal into a yard, lassoo it, and pull the rope until the beast either came up or choked down. The noose should then be loosened, and the pulling repeated. If the animal were vicious, its fore leg should be fastened up. If this were ineffective a leg rope should be put on. After a roller and crupper had been put on, a sack should be loosely hung from the D on the latter; this would cure the colt of any tendency to kick at anything that may fall off its back. The ropes should then be taken off and the animal allowed to go: after half an hour it should be again caught and driven until it could be guided with ease. The second day's work should be very similar, but it was necessary to teach the animal to lead. On the third day it should be caught, this time without the aid of the lassoo, and have a saddle and bridle put on. After being let loose for an hour the girths should be tightened, and the operator should mount and dismount a few times. When it became accustomed to this it could most likely be ridden without much trouble. Mr. Hiscock always threw a young horse and then handled its feet, pulled its tail, &c. Members thought patience a great factor in respect to the handling of horses.

Morphett Vale, August 23.

(Average annual rainfall, 23·32in.)

Present.—Messrs. A. C. Pocock (chair), H. V. Sprigg, L. F. Christie, F. Rosenburg, F. W. Crittenden, A. Anderson, S. Pocock, H. O'Sullivan, E. Perry, T. Higgins, W. Goldsmith, and E. E. Hunt (Hon. Sec.).

Greenfeed for Sheep.—The following paper was read by Mr. Goldsmith:—"The farmer with sheep should sow greenfeed every year on his dirty hay land. He should first run the cultivator over it to a depth of about 1½in., then drill with about 1½bush. of Cape barley and 1cwt. of super.; this can be finished before seeding begins. The cultivating leaves the seeds of the weeds on the surface, where they will germinate. If ploughed they would be turned under, where they would remain until worked to the surface again. The barley, being a fast grower, will come away with the weeds and there will soon be a picking for sheep. This can be fed off closely until the other feed gets a start. On account of the land having been once cultivated, the farmer, if he wishes, can fallow weeks later than on other ground. He will secure very profitable returns from his weeds and barley, and clean his land at the same time."

Mount Barker, August 13.

(Average annual rainfall, 30·93in.)

Present.—Messrs. J. Pope (chair), B. Pope, H. Jones, A. Ferguson, W. E. Daddow, W. Pearson, S. J. Bishop. L. Hughes, D. L. G. Monfries, F. Simper, J. Little, F. Follett, A. Boehm, C. Miels, G. and J. Cleggett, J. G. Thomas, A. Liebing, G. Milne, A. B. Blades, Davis, Mapley, H. Coventry, J. Choat, H. Coppin, P. Stephenson, C. Crompton, D. Wollaston, G. Warland, J. Woolley, P. F. Liebelt, J. F. Liebelt, R. Alexander, F. H. Adams, H. N. Bell, B. Stephenson, W. T. Stevenson, E. Schmidke, B. Fidler, R. Hollanby, C. Liebelt, F. von Doussa, J. Wilks, W. Jacobs, J. E. Smith (Hon. Sec.), and four visitors.

Hay.—Mr. H. Jones read the following paper:—"Cereal hay is one of the chief products of this district, and therefore should be worthy of our best attention, but farmers do not give it the consideration that they should. A few years ago it was thought that if the ground were ploughed, hand sown, and harrowed all had been done that was necessary by way of cultivation to procure a crop. Through being cultivated year after year the ground was fast losing its vitality, and the crops were failing for want of plant food. Since the introduction of fertilisers and up-to-date machinery into this State, modern science has done much for the advancement of agriculture, and successful crops can now be grown on land that a few years ago was considered useless for cultivation. In a district such as this, where the holdings are small and continually cropped, it is advisable to combine pea-growing and sheep-fattening with hay-growing to increase the fertility of the soil, and I know of no better method than what is known as the four course rotation. Plants differ in the food they take from the soil. The decay of the roots and stubble of one crop forms the plant food for the succeeding crop. There is also less likelihood of disease than would be the case if the land were cropped yearly with the same cereal. Wheat draws more largely from the soil and from a greater depth than oats. Oats depend largely on the atmosphere for plant food, and therefore can profitably follow a wheat crop. Peas are legumes, and are valuable on account of the nitrogen they store up in the soil, thereby increasing the fertility of the land, and setting free chemical solids contained therein. They can either be harvested or fed to sheep on the land at a fair profit. Take for instance a farm of 100 acres of arable land. Divide this into four paddocks or lots, as the case may be. In lot 1 put oats, in lot 2 wheat, in lot 3 peas, and on lot 4 run sheep. The following year reverse the order, commencing with oats in number four, and sheep in the oat stubble, which will give the best self-sown growth. The value of sheep for destroying weeds and increasing the fertility of soil is not yet fully realised in this district. If we follow this course of rotation we will have a much greater quantity of hay of a better quality. Some farmers are of the opinion that any sort of seed wheat is good enough for hay. This is a great mistake, for only well matured and clean seed should be sown. Wheat should always be pickled to prevent smut. A solution of 1½lbs. of bluestone to 15galls. of water is a good pickle. This should be placed in a cask, and the wheat in a bran bag dipped in this for about five minutes, 1½bush. as a time being immersed, at least a week before sowing. In selecting seed always see that it is clean, true to name, and suitable for hay, and the district. There are many recommended hay wheats, but for this district I advise such wheats as White Tuscan, Golden Drop, Bobs, Comeback, Purple Straw, Le Huguenot, Crossbred 53, and Marshall's No. 3, while for oaten hay there is nothing better than Algerian. The question of manures is one that calls for much discussion, as different soils need different kinds and quantities of manure. Some lack one chemical and some another, therefore, it is only by experimenting that we can tell which is the best for this district. From my own experience I recommend superphosphates for wheat, guano super. for oats, and bone super. or bone dust for peas. We know that the supply of artificial manures applied to the soil is not exhausted in one year, therefore by rotation of crops one manure has a chance to act with the other. The ground should be ploughed to a depth of 5in. or 6in., harrowed down fine to ensure a good seed bed, the seed and manures being then carefully drilled in to a depth of from 1½in. to 2in. In light soils the pressure springs should not be used or the seed will be drilled in too deep. If the drill is fitted with a set of drill harrows there will be no need to harrow after it. The soil grinder should next be passed over the ground to break down the clods and ensure a smooth surface for close cutting with the binder. The amount of seed and manure to drill in should be about 1½bush. of wheat with 1cwt. of superphosphates, 2bush. of oats with 1½cwts. of guano super., and 3bush. of peas with 1½cwts. of bone manure to the acre. Given an average rainfall a good crop of oaten and wheaten hay will result. The hay crops should be cut when the wheat in the ears has reached what is known as the early doughy stage, the grain being full, but soft, and the stalk and the lower flag commencing to lose color. Oaten hay should not be cut until the crop is turning from green to brown. If cut green the hay will be bitter. A great deal depends upon the binder. It should be in perfect order, for in the hands of an experienced man time will be saved both in cutting and handling the hay. Only the best twine should be used, as a cheap and inferior article causes delay. The hay should be stooked as soon after cutting as possible. The stooks should be made by hand, the heads being pressed firmly together. Each stook should contain from 30 to 40 sheaves, according to the size of the sheaf. About three acres of wheat and two of oats should be left to ripen for seed for the following year, and to provide straw for thatching the stack, if not under cover. If any of the stooks are blown down in windy and wet weather they should be put up again as soon as it is fine. An inch of rain will not hurt a crop of well stooked hay. Carting should commence as soon as the grain in the head has become solid or when the straws will break at the knots in the sheaves in the middle of the stook. When stacking in the open the middle of the stack should be built with the heads in, and well gabled for thatching, which should be done with wheaten straw as soon after reaping as possible. A hay shed is a labor saving investment, and will pay for itself in a few years. The object of this paper is not merely to show how to grow and harvest a crop of hay, but also to suggest a system of rotation that will keep the crops free from weeds, and help to build up and maintain the fertility of the soil for further requirements." Mr. G. Cleggett thought it better to allow a crop, especially oats, to lie for a day or so before stooking. He had a crop of peas and wild oats last year, and by feeding these to cows he secured better returns than he would have received had he fed the peas to pigs. Mr. Pearson thought it preferable to stook hay in three rows; the tops being put together, and a space left between the bottoms of the sheaves. White Tuscan made a light hay, hollow, and soft, and it was popular for chaff. He favored King's Early. He would cross harrow the ploughing, and then attach the harrows to the drill. Mr. J. Cleggett had mixed oats and wheat in the proportion of one to two, and the land sown with this returned three tons to the acre. Mr. Simper did not favor early wheats. He thought ploughing should be deep for peas, and shallow for the following crop. Mr. Coppin had cut Algerian oats early, and the grain developed afterwards. He was then troubled with mice in the stack. Mr. Pearson allowed the oats to ripen before cutting them. The Chairman favored Algerian oats, as the Cape oats went down if the crop were at all heavy. The heaviest hay crop he had grown was seeded with white oats, Algerian oats, and Crossbred 53. In reply to questions, Mr. Jones said he preferred half oats and half wheat for chaff. Bearded wheats affected the horses' mouths. Sheaves should be tied as tightly as possible; the hay became loose as it dried. Hay for chaff to be fed in the manger should be cut in the milky stage. Cape oats were not dependable. The feeding off of rank crops should not be tolerated; the patches so treated only became more rank the following year. He favored ploughing to a depth of 6in., or even 8in., if the subsoil would permit.

Port Elliot, August 16.

(Average annual rainfall, 20·33in.)

Present.—Messrs. J. Brown (chair), J. McLeod, H. Green, W. Squires, J. F. Vince, and W. E. Hargreaves (Hon. Sec.).

Strawberries.—Mr. Green mentioned that the strawberry plant only lasted for about four years; it was not advisable to replant the ground until the lapse of four or five years, during which time it should be well manured and sown to peas, beans, or clover. The Hon. Secretary had grown Marguerite and White Chilian strawberries on new land, and after three years ploughed them down, and added stable manure and bonedust. The following year he planted the same bed with White Chilian and Royal Sovereign varieties, and applied super. The first year the plants returned a good crop, but the second year little fruit was secured. Mr. Vince thought strawberries required a stony or gravelly soil. They should be planted on a hill facing the north or east.

Fruit-Drying.—Mr. H. Green read a paper, in which he mentioned that to secure continuous fine weather was one of the chief difficulties in connection with fruit drying. Apricots, peaches, apples, and pears required pitting, peeling, slicing, placing on trays, and sulphuring, if it was desired that the color should be retained. Prunes needed to be dipped in boiling water and caustic potash, or soda, in order to soften the tough skin. Plums were very liable to mould, and should be spread thinly in shallow boxes. Dried fruit should not be kept for more than 12 months, as the absorption of moisture from the atmosphere destroyed the keeping qualities. The opportunities of grubs depositing eggs on the fruit could be considerably reduced by the use of a drying kiln. Too much water should not be applied to trees when the fruit was to be dried. It should not be picked until quite ripe, but one difficulty was that the birds destroyed a good deal of it. In the opinion of the writer, bottling was more satisfactory than canning.

Willunga, August 2.

(Average annual rainfall, 25·98in.)

Present.—Messrs. Pengilly, Binney, Biggs, and Hughes (Hon. Sec.).

Dipping Sheep.—Considerable discussion took place on this subject; the necessity for it was admitted by all, and members were agreed as to the value of the practice. They considered, however, that greater care should be taken to enforce the Act after notice had been served upon stockowners. Some men conscientiously dipped their sheep, while others appeared to ignore the instructions to do so. Unless all were compelled to carry out the instructions of the stock inspectors it was futile for any to dip. It was considered that owners of dips should be required to supply sheepowners with certificates—these to be forwarded to the Chief Inspector of Stock. This would make it a simple matter to discover those who had ignored the instructions.

[In connection with the above, the Chief Inspector of Stock remarks—" The Inspector for that district has been most assiduous in his efforts to see that all infected sheep are dipped. If the members of the Agricultural Bureau would carry out the suggestion published in the *Journal of Agriculture* about two years ago and form a local vigilance committee, with a view to keeping negligent owners up to the mark they would be rendering good service to their district. Cases of infringing the dipping regulations should be reported to the Stock Department."—Ed.]

Woodside, August 13.

(Average annual rainfall, 31·95in.)

Present.—Messrs. G. J. Sampson (chair), W. King, W. Rollbusch, H. Howell, R W. Kleinschmidt, H. Rollbusch, F. W. Baldock, A. S. Hughes, J. S. Pfeiffer, C. W. Fowler, J Lauterbach, and J. Morcom (Hon. Sec.).

INTENSE CULTIVATION.—In a paper on this subject Mr. Fowler expressed the view that land in this district was capable of supporting a much greater population than was at present occupying it. Conservation of water and irrigation would have their place, and co-operation amongst producers would necessarily become a big factor. From 20 acres to 80 acres, according to the nature of the land, was sufficient to support a family The growth of raisins, currants, and apples, together with dairying, could be profitably undertaken, and bi-products, such as pigs, poultry, and bees would be found to considerably augment the income. He estimated the return from a 40-acre block, intensely cultitivated and irrigated, as follows :—30 tons from 10 acres of grapes at £3 per ton, £90; 2,000bush. apples from 1,000 trees on 10 acres at 2s. per bushel, £250; return from three cows feeding on 10 acres of lucerne or other fodder, £24; 30 tons hay from 10 acres, £120; a total of £484, to which was to be added the value of the bi-products. The writer thought it should be unlawful to cut township allotments into sizes smaller than one acre. Mr. Lauterbach, in discussing the subject, said that in time land intensely cultivated would become exhausted. Mr. Hughes thought it unadvisable to plant vines in this district on account of their susceptibility to frosts. Mr. King thought township blocks should be not smaller than half an acre, and that only one house should be put on each.

SOUTH-EAST DISTRICT.

Kalangadoo, August 9.

(Average annual rainfall, 33in. to 34in.)

SEEDING PREPARATIONS.—Mr. D. W. Tucker contributed a paper. In a district such as this, he said, it was necessary for the farmer to carefully study the soil he had to work on account of the great variation in the nature of the land. Heavy black and red soils required a great deal more working than soils of the lighter class. The former were best broken up in summer, and gone over with the harrows or cultivator and reploughed before seeding. This would keep the weeds well under. Sandy soil, when broken down too fine, did not drain well, and had a tendency to run together; it was best therefore not to break the sod any more than necessary. The selection of implements was an important point; they should not be chosen simply on account of cheapness. He was of the opinion that three acres cropped well would return as much as five acres carelessly treated.

Keith, August 9.

(Average annual rainfall, 19·20in.)

PRESENT.—Messrs. MacIntyre (chair), Tilgner, Fulwood, Redpath, Shannon, and Lock (Hon. Sec.).

AGRICULTURAL LABOR.—The Chairman read a paper, as follows :—" In our State not so much attention has been given to the consideration of this subject as in two, at least, of the other States. But it goes without saying that we should be equally concerned. One approaches the subject with some trepidation, for it is so often dealt with in other circles than that to which we belong, and in an atmosphere that does not make the issue to be seen clearly in all its importance. It is evident that every man who requires the assistance of others to work his land is interested in this question, be his holding large or small. It is natural that one should begin with the labor required to deal with scrub lands, if the holding is one in a newly settled district, such as this, where the first step is mullenising the timber or rolling down the mallee scrub. This work is best done by contract, which, with the rates now prevailing, enables a man to earn good money. The fixing of rates for particular areas must be determined—(1) by the kind of timber to be dealt with; (2) and the way in which the owner wishes it to be done. To prevent misunderstanding, and to ensure the job being properly carried out, it is always well to have the conditions of the contract written out beforehand. An inspection of the work as it is being proceeded with is also desirable with the same end in view. In the case of rolling mallee where the scrub has to go under the roller, these preliminaries are perhaps not so necessary. In the next stage, *i.e.*, clearing by burning off, the contract system is again the best. A man on contract will not be unwilling to go out for an hour after dark to attend his fires, where this could not be expected of a man on weekly wages. The contractor knows how much advantage is gained by an hour a night given to his fires. The third stage—that of fencing—is often work that is best done by contract. Here, too, the price must be regulated by the kind of fence required and the nature of the sinking, as far as that can be ascertained. What has been said as to the fairness of the contract system in clearing and fencing is equally applicable to the case of well-sinking, where payment by the foot is the best. It is, however, when these stages are passed that the most difficult ones are reached, viz., reasonable payment for the many other kinds of work on the farm. Owing to the man on the land dealing at firsthand with the forces of nature in the soil, in the seasons, and in working and grazing animals it is impossible for him to regulate the hours of labor as it can be done in mechanical industries. Then the fact that so much of the work is not continuous or arduous is another source of difficulty in trying to arrange the hours of work to a nicety; *e.g.*, during the ploughing and seeding the feeding and grooming of the team before breakfast has a set off in the two hours' spell during dinner. It has to be remembered as well that in our summer climate long spells in harvest are necessary, both for men and horses. Coming to the case of those dairying, something of the same applies. The cow's habits have to be studied, for she refuses to give way to twentieth century progress, and will not be hurried. In trying to arrive at what is a fair rate of wages, equal difficulties lie in the way. There is first of all the variation of the yield of the land, due to the season and its inherent quality. There is the variation in the price of most kinds of primary produce, especially wheat. The distance over which produce has to be carted to the market or railway; in one case it may be 2 miles, another 20 miles. Then there is the important question in the difference of men to be employed—one man may be more careful in the management of his team. Again, a man who is intelligent and understands the working of modern implements is worth more than a man who is without much of either. Everyone knows how much loss of money and time is due to want of skill and care in the using of tools and implements. In order to get experienced men for the more important work, and where so much valuable property is at stake, as well as for taking the responsibility of leading the work, I favor the engagement of a married man for a period of, say, a year. It would be necessary in this case to provide him with a home, along with which he should have land for a garden and fowls, &c. On a place where several young men are employed, arrangements might be made for them boarding with him. The quarters for the men should be comfortable and clean. An inspection of them from time to time would be in the interests of everyone." Members generally agreed that the regulation of the hours of labor on the farm was not practicable.

Kybybolite, August 21.

(Average annual rainfall, 22in.)

Present.—Messrs. A. Bradley (chair), F. C. Lacey, G. H. Hahn, G. S. Jenkins, H. B. Schinckel, E. W. Duffield, L. Smith, A. Bradley, jun., S. Alcock, J. Davis, C. H. Scholz, A. R. Scholz, E. C. H. Schinckel (Hon. Sec.), and four visitors.

The Points of the Horse.—Mr. W. J. Colebatch, B.Sc., Agric., M.R.C.V.S. (Superintendent of Agriculture in the South-East), gave a practical demonstration on the points of a horse. He said—"Most farmers possess a fair knowledge of the general characters to be looked for in a horse of good quality, but few would care to undertake the responsibilities of show-ring judging, or to officiate in any capacity in which their knowledge of the points of a horse would be brought under the searchlight of public criticism. This may be due to natural reluctance to publicity or to a want of confidence, which may be attributed in some cases to a want of method or system in the process of judging. No matter what the circumstances may be—whether the examination be made in the show ring or sale yard, the aim should be to adopt some definite and thorough system of working. Once adopted, the method should, as far as possible, be rigidly adhered to. In many instances, of course, circumstances will not permit of a complete examination and only a cursory survey may be possible, but even in such cases the man who has habitually trained his powers of observation on a well-arranged plan will be in a better position than those less well schooled. In the general examination of either light or heavy horses the most important points to be considered are conformation, quality, and action. In judging draught horses, the eye needs to be specially keen to detect defects on account of the thicker skin, coarser hair, and the 'feathered' shanks. Furthermore, heavy breeds, owing to their lymphatic temperament, are more prone to lay on fat and so round off the inequalities of form than are the lighter types. Such pampering of draughts should be carefully guarded against, as the lack of symmetry becomes all too rapidly apparent when the animal is again reduced to healthy, working condition. In order to grasp the real significance of the importance of conformation, it is essential to mark the extent to which bone and muscle respectively contribute to the external form or outline. The shape of the head is determined by its bony skeleton, the neck, on the other hand, consists chiefly of muscle and ligaments. The shoulder and chest are formed mainly of bony structures, but muscles help to fill up the depressions. The arm and forearm are shaped by muscles, and from the knee downwards the form is dependent on bones and tendons. From the loins to the buttocks and down to the point of the hock the muscular development is very marked, and it is here that we find located the propelling muscles of the body. Whereas the forequarters are relatively bare, the hindquarters, croup, and thigh are very largely composed of powerful bundles of muscular tissue. The manner in which the horse distributes the weight whilst standing asleep indicates that the forelegs are chiefly weight-carriers, and this theory is further supported by the loose attachment of the shoulder plates as compared with the snug ball and socket joint at the hip, and also by the manner in which the fore end of the trunk is suspended, as it were, in a muscular sling between the blades. Below the point of the hock the outline of the limb is dependent on osseous and tendinous structures, as in the case of the fore leg. In light horses, where speed and staying power are of pre-eminent importance, the general form should be of neat build, symmetrical, and well proportioned. The skin should be smooth and close-fitting, and should be well covered with fine quality hair. The importance of a good skin is better appreciated when it is realised that the lining membranes of the food canal develop from the same embryonic layer as the third stratum of the skin. It is not, therefore, illogical to draw deductions as to the digesting and assimilating capacities of an animal from the character of its external integument. Draught horses should be squarely built, even, heavily muscled, and comparatively low set. For heavy traction weight of carcass is of special importance. Length rather than bulk of muscle is to be looked for in light horses. Muscles are composed of fine parallel contractile fibres, and the longer these fibres the greater the range of movement. Hence, the muscles of greatest length are to be sought after in animals required for fast work, whereas in the heavy breeds the short, stout, thick muscles that denote power are in demand. Whilst the source of muscular energy should differ in character, according to the purpose in view, the distance through which the force is transmitted should invariably be short, as the loss in transference increases with the distance traversed. It follows from what has been said that the forearm in light horses should be as long as possible, with due regard to proportion, whilst in draughts it should be short, stout, and thick. In both types the cannon bones should be short. Whilst speaking of the muscles, it may be pointed out that the forearm and lower thigh, or gaskin, are almost entirely muscular, and since there is little tendency at any time for fat to accumulate in these regions their development may be accepted as a guide in the formation of an opinion as to the general muscular condition of an animal in useful condition. Reference to these parts may, therefore, be useful as a means of picking out useful types from a mob of low-conditioned horses, or of rejecting likely animals that have been fed up for sale. Consideration should also be given to the phrase 'flat bone,' which is so commonly employed to describe desirable conformation in the region of either the fore or hind cannons. The exact meaning is very often misunderstood. The cannon bone in the fore leg is only flat on one face, and that the posterior one, which is so covered by soft structures as to be unobservable from the outside. The front and side faces of the bone are distinctly rounded, and the curvature in the hind cannons is still greater. The phrase, therefore, cannot be interpreted literally. It has reference to the flat appearance of the lateral faces of the region between the knee (or hock) and fetlock joints, and this flatness is determined mainly by the manner in which the tendons at the back of the legs stand out with sharply defined edges from the back of the bone. This type of conformation is desirable for the reason that there is generally associated with it a hard dense quality of bone, clean cord-like tendons, and a minimum of subcutaneous connective tissue." The special features of the particular regions were then described in greater detail. Members then inspected the crops on the Government Farm, and were agreeably surprised at the growth these showed, especially in the case of the wheat and kale.

Millicent, July 8.

(Average annual rainfall, 29·25in.)

PRESENT.—Messrs. Mullins (chair), Holzgrefe, Bowering, Hart, Edgecombe, Serle, Downs, Major, and Day (Hon. Sec.).

BERSEEM.—Mr. Holzgrefe reported that the berseem (Egyptian clover), which he had carefully sown, had not made satisfactory headway, and it had not returned any bulk of feed. Mellilotus was far superior to it as a fodder. Mr. Mullins also stated that it had not been a success with him.

TREE-PLANTING.—Some discussion took place on tree-planting. Mr. Holzgrefe recommended the utilisation of poor land by planting suitable trees, which would in time be valuable as shelter for stock and also for firewood. He had found that trees obtained from a nursery did not do well when transplanted in an open situation. Mr. Hart advised farmers to grow their own trees from seed. Remarkable pines and blue gums were mentioned as suitable for this district.

Millicent, August 12.

(Average annual rainfall, 29·25in.)

PRESENT.—Messrs. J. J. Mullins (chair), H. F. L. Holzgrefe, G. Major, J. Bowering, W. Downs, and H. Day (Hon. Sec.).

PROPOSED EXPERIMENTAL FARM.—Mr. Holzgrefe drew attention to the fact that a vast area of land was being reclaimed in the district, and expressed the view that the Government should establish an experimental farm in the locality immediately. The people who would settle on the reclaimed lands in the South-East in the near future would be newcomers for the most part, and the farm would be of immense benefit to them, as well as a help to the older settlers. Even now farmers on the Millicent flats experienced occasional failures owing to not knowing the exact requirements of the soil. The soil on the Wyrie was typical of large areas of unoccupied land in the South-East. It was decided, on the motion of Messrs. Holzgrefe and Downs, that the Branch take the necessary steps to urge the Government to select a site on the drained country suitable for the purposes of an experimental farm, and that the Lucindale, Penola, and Kalangadoo Branches be asked to co-operate in the movement.

Mount Gambier, August 9.

(Average annual rainfall, 32in.)

PRESENT.—Messrs. D. Pritchard (chair), A. Sassanowsky, E. F. Crouch, J. F. Holloway, J. Bottrill, H. Kennedy, H. Wheeler, E. F. Schlegel, W. J. Sutton, C. Major, H. Buck, J. Watson, J. C. Ruwoldt, G. and D. Collins (Hon. Sec.)

DAIRYING.—Mr. E. F. Crouch delivered an address, in which he stated that there was no disadvantage in dehorning cows whilst they were in milk, and it would be found that the animals were afterwards much easier to handle and less likely to damage one another. In travelling round the district he had observed generally a poor class of cows, and it would be a good thing if the dairy factories would purchase good bulls for the dual purposes of beef and milk. There were good cattle for both. For example, the milking strain of Shorthorn and the Lincoln Red. In England at the present time there was a good demand for the Lincoln Red. and dairy people were giving as much as 50 guineas for a bull calf 8 or 9 months old. If a dairy factory purchased a bull it could be placed in charge of some shareholder, and the shareholders could have the use of it on application on any terms fixed. If that were done he would suggest that any man who had a cow of a particularly good test should be allowed to have that cow served by the bull at a lower cost than was charged for an inferior animal That would be an encouragement to keep a better class of cows. If all the factories went in for the same system these bulls could be exchanged from time to time, and if all the receipts from the bulls were put into a fund, this would be available for the purchase of other bulls when required. He then urged the necessity for care in feeding young calves, and read an extract from an English publication relating to experiments with grasses at Woburn. Mr Sassanowsky agreed as to the advisability of dehorning cattle. The suggestion that dairy factories should purchase bulls was an excellent one.

Penola. August 2.

(Average annual rainfall, 26·78in.)

Present.—Messrs. A. E. Lampe (chair), J. T. Williams, J. Darwent, J. Warner, D. Adamson, P. H. Kilsby, W. Miller, D. A. Fullerton, S. L. Norman, J. Redman, L. W. Peake, S. Ockley (Hon. Sec.), and two visitors.

Draught Horses.—Mr. P. H. Kilsby read a paper, as follows:—"Farmers should take particular care when procuring draught horses for the farm. It is much better to buy mares than geldings. As farmers in this part finish seeding about August, that gives the mare time to have her foal, and get into condition for the harvest. Some buy a gelding because they can get him at 3 years old for £30, and refuse to give an extra £10 for a good mare at the same age. When the gelding is about 8 years old he is worth about £20, and the mare £30, allowing the same depreciation on both. But in the five years the mare might produce at least three foals. Use only the best sire procurable, regardless of cost, as the high priced horse is the cheaper in the long run. For this district I prefer the heavy draught, both for farm and contract work, and there is always a better demand for these, even when the market is dull. Farmers should always try to improve their horses. If one only has a medium mare, mate her with the heaviest sire procurable. I believe in working a mare lightly up till within three weeks of foaling, there will then be very little trouble. It is a great mistake to let her get too fat. It is also a bad practice to take the mare away from her companions a few days before foaling, as she frets for them. Put another mare in with her to keep her company in a warm paddock at least a week before foaling. I always catch my foals when about a week old, teach them to lead, tie up in the stall, and pick up their feet. If this is properly done the foals will never forget it, and at harvest time the foals can be tied up or taken to the harvesting paddock. It is a good plan to feed them together when they are about 7 months old. Put them in a yard at dinner time, do not allow them to have a drink from their mothers, allow them water and feed, and to go with their mothers at night. Wean them at eight months. When turned out, they will soon forget their mothers. I always make it a practice to save a small paddock for weaning time, and thus ensure a good supply of natural grass. This, together with a good feed of chaff and bran twice a day, should carry them well up to spring. A colt should not be castrated before 18 months old, as early castration tends to rob it of a certain amount of vitality, and when left the animal has a chance to form a good crest, which looks very becoming on a gelding. Breaking in can be done at 2½ years old, providing only light work is done the first year. It is well to break in two at the same time, and work them half a day each. If wanted for heavy work 3 years to 4 years is best, but for ordinary farm work 2½ years is preferable, as at the earlier age they are more tractable, and easier to handle, and have not forgotten the attention given them when foals. Great care should be taken of the horse's shoulders at this stage. As soon as possible after working they should be washed well with cold water, with a little salt added, and then with a wattle-bark solution. This keeps the shoulders from cracking and blistering, and hardens the skin. The collar must be of a good fit, and should be brushed well before being used. I recommend putting a filly to the sire at 2 years, as this minimises the risk. The bones have not become set, as is the case with a filly a year or two older. If this procedure were more generally adhered to a great saving to breeders would result, as the percentage of losses among draught mares is very great, which is caused very often by allowing the mares to get to the age of 5 or 6 before commencing to breed. My experience in watering draught horses has led me to the conclusion that it is as well to allow a horse to have a good drink as soon as work is finished. I have never known of any ill effects resulting from this. Regarding the feeding of farm horses, give them a 5-gall. drum each, with some oats and bran or boiled barley added, for breakfast. They should be fed at least one and a half hours before work. At the mid-day meal give more oats than before, and at night, when they come in from work, a little bran should be put in, and they should be made to clean up any chaff that may have been left. Then put in a small feed, and at 9 o'clock give them enough for a good feed. Horses should be well bedded down. Give them plenty of good dry straw, they need a good soft bed, they should be rugged all the winter, even if they are kept in the stable. I believe in rugging horses, as it keeps them warm, gives them a fine coat, and they do not require so much grooming. The stables should be cleaned out every day. Always keep rock salt in the feed box. Horses require two packets of salts at the week end to keep their blood in order. I recommend all farmers to keep a few tons of chaff over for the harvest, as horses do not do well on new hay, and waste more than they eat. They will not work on the natural feed alone, and it is not wise to let them go down in condition at this time of the year. All harness should be overhauled, the collars being given special attention, as horses are more likely to get sore shoulders at harvest time than at any time of the year."

Mr. Adamson asked the opinion of members with regard to a stable floor, and Mr. Kilsby recommended split slabs 4in. wide and 6ft. long; but particularised that they should be split and not sawn, and then horses would not slip on them. Mr. Fullerton recommended straw bedding to minimise the slipping. Mr. Williams advised screened gravel with a good slope, well tamped with plenty of sand, and top dressed with hot tar. It was advisable to repair every little hole as soon as it appeared. Drainage was most important. Mr. S. L. Norman said temperament of the sire was most important He agreed that farmers generally should improve their stock. His ideal was an animal with 10in. bone and 16 hands in height. He had a great opinion of the Suffolk-Clydesdale; but there was difficulty with the mare from the cross. The Secretary said they should consider the class of land that was to be worked and the work they had to do; where they were not always in use on the land, lighter horses could be used. Mr. Williams had had a lot to do with light horses, and, though they might have a slightly better crest if left till 2 years old before being castrated, it did not make any difference to their stamina, and when one considered the greater difficulty in handling them at the older age, he preferred castration at 4 months old. That might not apply to draught horses, but it was his opinion with regard to light. Mr. J. Darwent said trouble often arose from castrating too close. He believed that if, when castrating, they took out the main testicle and left the button they would find that their horses would have more pluck and endurance and better carriage. Mr. Kilsby, in reply, said he always handled his foals when a few days old and docked them then, as he found they lost less blood than at marking time, when the one loss was sufficient.

Tatiara, August 2.

(Average annual rainfall, 19in.)

Present.—Messrs. Sullivan (chair), P. Low, C. Stoude, E. Prescott, T. Stanton, A. Fisher, and T. L. Truman (Hon. Sec.).

Sheep Skins.—Mr. Stanton read a paper as follows:—"The value of the average sheep skin in the Adelaide market is about 7s.; that is if it is well dried and taken care of. The same skin, badly cared for, is worth only about 3s. The average farmer kills 50 sheep in a year; 50 skins at 7s. equals £17 10s.; the same number of skins badly cared for at 3s. equals £7 10s.; showing a loss of £10 on every 50 skins where they are not properly treated. The number of skins marketed each week is about 12,000, which at 7s. are valued at £4,200, and at 3s. £1,800, showing a loss of £2,400 if they are poorly treated. A good deal of this loss can be avoided. The farmer who keeps skins for longer than three weeks should have a supply of skin wash ready mixed in an oil tin. As soon as the skin is taken off the sheep, spread it out flat, and give it a good wash all over on the pelt side, then hang it longways on a rail in a shed. Fold the tail in under the skin, cut off the feet, and hang weights of about 1lb. on each leg. Inspect the skin two or three times while drying and turn out any pieces that may be folded in, so that they can dry. When the skins are thoroughly dry, place them in a dry, clean place, pelt to pelt and wool to wool. If forwarding to market, fold the skin double, longways, wool outwards, turn in the head part, and do not make too heavy a bundle." Members were divided in opinion as to the value of skin washes. Some thought the writer's estimate of the average price of skins too high.

Wirrega, August 9.

(Average annual rainfall, 19in. to 20in.)

Present.—Messrs. H. Exton, P. Prime, C., F., and E. Meier, F. and L. Densley, J. Green, H. Laurenti, L. Pitman, L. Cook (Hon. Sec.), and a number of visitors.

Fallowing.—Mr. Williams, in a short paper, said it would not pay to fallow new ground. He did not think good crops could be grown until the majority of broom stumps had been destroyed, and this would take two or three years. He preferred the mouldboard plough. Fallow should be ploughed to a depth of about 4in. Shoots should be cut, raked up, and burned. Following this, the land should be cultivated after a good rain. Harrowing would serve the purpose on light sandy soil. Members generally favored fallowing to a depth of 4in. Some preferred the disc plough, as it cut shoots and lateral roots, and chopped out the broom bush, whilst others favored the mouldboard implement. This pulled out more stumps, left the ground in a better condition, and hence, the fallow was better. It was deemed inadvisable to work the lighter lands much before summer, especially if there were no trouble with weeds.

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T. PASCOE,
Minister of Agriculture.

POINTS FOR PRODUCERS.

Government Produce Department.

That the operations of the Government Produce Department does not escape the attention of interested parties abroad is shown by the following paragraph clipped from *The Live Stock Journal*:—"The South Australian Government Produce Works is taking an important part in the world's meat supplies. For some time past the department has been treating boneless beef killed by private butchers, but the ready sale of this article and the great demand for oversea markets has led to the Government erecting a slaughter-house at their works in Port Adelaide. This slaughter-house has a capacity of something like 60 carcasses per day. Considerable quantities of frozen lamb and mutton are already shipped to London, and between 100,000 and 200,000 carcasses are dealt with in this manner. Official figures taken from the last Statistical Register give the head of cattle as being 393,566, and for sheep as 6,171,907.

South Australian Sheep.

South Australia, states *The Live Stock Journal*, still holds the record for abnormal length of staple, for recently a lock of wool 4ft. 6in. in length was exhibited in Adelaide, and is quite unsurpassed by anything to be met with or heard of in any other part of Australia. A case has been cited recently of a fleece of three years' growth raised on the hot plains of Central Queensland. It was a South Australian-bred sheep, and the constitution for which South Australian sheep are so well noted is held responsible for the retention of this growth during three hot summers.

Farmers at Roseworthy.

On Monday, September 16th, about 160 producers availed themselves of the invitation of the Minister of Agriculture (Hon. T. Pascoe, M.L.C.) to attend the annual inspection of Roseworthy College and grounds. In addition to the Minister there were present Professor A. J. Perkins (Principal of the College), the Secretary to the Minister (Mr. W. L. Summers), the Secretary of the Advisory Board (Mr. G. G. Nicholls), the Dairy Expert (Mr. P. H. Suter), and the various officers connected with the College. Needless to say the crops were in a very backward condition, and presented a striking contrast to what has been seen at the College in previous more favorable seasons.

Nevertheless the visitors, who were afforded every information possible by the Principal and his assistants, spent a most enjoyable day and gained a great deal of useful information. Particular interest was evinced in the berseem or Egyptian clover plots, which this year have proved a veritable godsend in the way of providing fodder for the dairy stock. Some of the plots had been cut twice, and its vigorous growth testified its value in a season like the present. At the conclusion of the inspection the Minister briefly addressed those present, and on his initiative hearty cheers were given for Professor Perkins.

Australasian Fruitgrowers' Conference.

The annual conference of the Fruitgrowers' Association of Australasia will be held in Adelaide this month. The inter-State delegates will arrive on October 21st, and, with the assistance of the Minister of Agriculture (Hon. T. Pascoe), an attractive programme has been arranged for their entertainment. On their arrival at Murray Bridge on the Tuesday they will be met by the Director of Irrigation (Mr. S. McIntosh) and members of the executive of the South Australian Fruitgrowers' and Market Gardeners' Association and conveyed by launch to inspect the irrigation and reclamation works in the vicinity of Murray Bridge. The conference will be opened by the Minister of Agriculture in Adelaide on the Wednesday morning, and in the afternoon the visitors will be taken for a trip along the Torrens Valley. In the evening it is proposed to hold a social. After a morning session on Thursday there will be a drive through the Adelaide hills, by way of Norton's Summit, Mount Lofty, and Belair. On Friday morning the business sittings will be resumed, and in the afternoon, at the invitation of the Government, the visitors will inspect the Produce Depot at Port Adelaide, and have a trip to the Outer Harbor. The conference business will be concluded on Saturday, if not earlier, and it is intended to make a visit to the Government Experimental Orchard at Coromandel Valley. It is anticipated that each of the Australian States and New Zealand will be represented at the conference.

Adelaide Wool Sales.

The first of the 1913 series of wool sales was held in Adelaide on Thursday, September 18th. The catalogues comprised 27,581 bales, which is a record for an inaugural offering of the season. There was a large attendance of buyers, all sections with the exception of America being well represented, and competition was animated. For all good wools the market was from par to 5 per cent. above last year's opening rates, but in regard to the heavier-conditioned lots the improvement was not so marked. Lambs' wool, especially the good lines, ranged from 1d. to 2d. a pound higher than at the first sale in 1912. A feature of the sale was the activity of the French buyers, the wools, which at the opening almost invariably come from the back country, especially suiting their requirements. Strong competition for good wool was also evinced by Sydney buyers, who secured about 1,500 bales, chiefly of the good, shafty, combing wools. Of the total offered 26,756 bales were sold, the highest price realised for greasy Merino being 11¾d.

Lack of Farm Laborers.

Judging from statements appearing in various English agricultural papers the dearth of farm laborers is a problem by no means confined to the Commonwealth. The subject has recently been discussed at meetings of various local agricultural organisations in England. One speaker, at a meeting of the Cumberland and Westmoreland Chamber of Agriculture, expressed the opinion that the solution of the problem was more married servants and the provision of more cottage accommodation.

Care of Farm Machinery.

The expense of farm machinery, says *Campbell's Scientific Farmer*, has steadily increased for a number of years past. The average life of the ordinary farm machine is not what it should be. The adjustments in the machine and the care of it should be just as thorough and painstaking as the adjustment of the harness and care of the horse. Each has a life to give, one animate and the other inanimate. Both will lose money for the man who does not give them proper care. The loss in farm machinery is just one of the big leaks on the farm. To stop it, house and care for the farm machinery.

The Effect of Watery Foods on Milk.

The August issue of *The Journal of the British Board of Agriculture* contains an interesting summary of the literature which has appeared during recent years on the effect of watery food on the production and quality of milk. After quoting the results of several experiments the article proceeds:—"The general view of those who have studied the subject seems to be that excess of drinking water does not appear to have any effect whatever upon either the quantity or quality of milk. Special attention was given to this question in the experiment organised conjointly by the Board and the Agricultural Education Association in 1910. It seems, therefore, unreasonable to expect water administered in any other form to have any effect on the yield and composition of milk. The experiments cited show that there are certain watery foods (such as roots) which appear to have no very pronounced effect on the milk, while others, such as pumpkins, reduce the secretion materially. Still others (brewers' grains) have, by general consent, a marked stimulating effect. It would appear, then, that the water content of the food as such has but little influence on either the quantity or quality of the milk. It is one or more of the other ingredients of the food—not necessarily nutrients in the ordinary sense—which are responsible for the variation in the output and fat content of the milk. It was pointed out in one bulletin that brewers' grains might have a physiological effect resulting in increased flow." In this connection attention is then directed to experiments made by Dr. Hopkins, of Cambridge, from which the following conclusions are drawn :—" 1. That many feeding stuffs have a specific effect on the yield and quality of milk; and (2) that this effect is to be attributed to stimulating substances in the food substances which have physiological rather than nutritive effects, and which are present in foods in small quantities only."

Credit Banks.

Judging, says the *Agricultural Gazette*, from the voluminous reports published month after month on this subject by the International Institute of Agriculture, it would seem that farming is carried on in most European countries mainly by means of borrowed money; also in India and Japan to a less extent. Great Britain, British Colonies, and the United States appear to have managed to conduct farming enterprise without any considerable resort to co-operative credit. The system has spread slightly in England; but the business done by it is the veriest trifle. In Ireland it has made greater headway.

The Man who Wants to be a Farmer.

It is strange, but it is true nevertheless, that the greatest advancement in the line of scientific farming is being made, not by the man who is a farmer by birth and inheritance, but by the man who wants to be a farmer—the man who gets his knowledge first and then proceeds to apply it. There is a great movement on hand for better farming methods, but the initiative is coming from the cities and towns and from the centres of agricultural education. Practical knowledge is a mighty thing, but when it is not backed by scientific information it is of little worth. It is little better than theoretical knowledge without practical experience. The best farmer in the world is the one who, having the practical experience, adds the scientific knowledge that tells him why he does things. He is then master of the situation. The next best farmer is the man who wants to be a farmer and begins with a foundation of scientific knowledge, then adds experience. His experience may cost him something, but it will not cost him as much as the experiments of the hit-and-miss practical farmer will cost him.—*Campbell's Scientific Farmer.*

Waterproof Cornbags.

The New South Wales Department's Foreman of Works supplied a correspondent with a useful wash for applying to cornbags to render them waterproof. He states stone lime, coarse salt, glue, and fat or oil, mixed in the following proportions, will make a good covering for bagging :—Take 10lbs. lime, slake with boiling water, and strain ; then add 1lb. glue and 1lb. coarse salt, dissolved. To each 4galls. of limewash add 1lb. fat (or oil) ; stir the whole together, and cover for a day before using. This mixture will keep for at least three months if placed in a cask and covered with a bag coated with limewash. To make it waterproof, the usual plan in making a tarpaulin is to give the canvas a cold coat of boiled linseed oil, and, when this has dried, a coat of Stockholm tar. If necessary, give a second coat of tar, and if it should become hard, or show signs of cracking, apply a coat of raw linseed oil.—*The Farm Journal.*

Weed-Infested Lucerne.

Replying to an inquiry *re* weed-infested lucerne, Mr. H. A. Ross writes in the *Agricultural Gazette of New South Wales*—" It is advisable to cut the lucerne together with all the rubbish that may be in the field, with a mower, about this time of the year. The first cutting will be done, of course, when the plants are out in flower. It would be well to let the rubbish lie in the field in preference to carting or raking it off ; this will act as a mulch to the crop."

Processes in the Soil.

There are two great processes going on continually in the soil, which are known to be due to the activities of bacteria—(*a*) The conversion of ammonia and other compounds containing nitrogen, derived from decaying organic matter and nitrogenous fertilisers, into nitrates, the only form in which, so far as we know, plants can utilise the nitrogen. (*b*) The utilisation of free nitrogen of the atmosphere by leguminous plants. Both these processes are greatly facilitated by the presence in the soil of a sufficiency of lime. The application of lime to the soil is one of the oldest methods of treatment known in agriculture. It was apparently employed by the Romans 2,000 years ago. In various European countries it has been practised for many years past.—*Mark Lane Express.*

Sheep for Meat Production.

It is undeniable that the sheep species, both in the lamb stage and when older, furnishes meat of most excellent quality when the animals are suited for this purpose. Therefore the present seems to be an opportune time for stockmen to pay more attention to the raising of sheep for meat production. This Bureau has for a long time recognised the country's lack in this respect, and has taken steps to improve the situation. Through its Animal Husbandry Division sheep-breeding experiments have been in progress for years, the most important of these being the co-operative work with the Wyoming Experiment Station for the purpose of producing a range type of sheep that will be of good mutton form as well as yielding a heavy fleece. These, as well as other experiments with strictly mutton breeds, are still progressing. Finally, it would be in the interest of economy for the people generally to cultivate a greater taste for mutton and lamb, especially the smaller families who require joints of a size that cannot usually be supplied from the larger beef animals. A more insistent demand on the part of the public for mutton and lamb of good quality would no doubt soon lead to an increase of breeding and feeding operations, besides relieving somewhat the present heavy demand for beef and pork in the face of a short supply.—Annual Report, Bureau of Animal Industry, U.S.A. Agricultural Department.

Whitewashing of Fowlhouse Roofs.

The whitewashing of fowlhouses inside is always recommended, but it is almost as important during the summer to have the roof whited also. One can hardly believe the difference it makes to the temperature inside, but try it by placing one hand on a part that is whited and the other on the felt or galvanised iron before whitewashing (of course, when the sun is shining on it). Not only does the reduction in temperature prove a great boon to the birds, but it saves in a measure the shrinking and warping which pulls a roof about so during a hot summer.—G. Parker, in the *Poultry World.*

Sound Stallions and Registration.

Be it for heavy or for light horses, says *The Live Stock Journal*, there is not the slightest doubt that the still quite new scheme launched by the Board of Agriculture in regard to the registration of stallions is being taken up "with avidity," to quote W. S. Gilbert, by the possessors of sound horses. From the official report upon the work of the Light Horse Breeding Advisory Council, one gleans that, so far, 825 stallions have been registered as against 715 in 1912, and, as this number is exclusive of stallions registered in Scotland, the returns must be considered encouraging. The Board, one notes further, has decided to amend their registration regulations so as to allow two appeals instead of one, and also to confine the certificate of the examining veterinary surgeon to the soundness of the stallion, the question of its suitability being left for determination, if necessary, by a conformation judge appointed by the Board.

Imports and Exports of Fruits, Plants, Etc.

During the month of August, 1913, 21,221bush. of fresh fruits, 13,165 bags of potatoes, 287 bags of onions, 8bush. of sweet potatoes, and 82pkgs. of trees and plants, etc., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Act of 1885; 68bush. of bananas (over-ripe) and 1 parcel of plants (containing vines) were destroyed. Under the same Act, 22 bags of potatoes were exported to West Australia. Under the Federal Commerce Act, 2,350pkgs. of fresh fruits, 2,450pkgs. of dried fruit, 36pkgs. of preserved fruit, 14pkgs. of honey, and 12pkgs. of jam were exported to oversea markets during the same period. These were distributed as follows:—For London, 187 cases oranges, 1,764pkgs. of dried fruit, 12pkgs. of jam, and 3pkgs. of honey; for Bremen, 1 case of oranges; for Genoa, 11pkgs. of honey; for India and the East, 100 cases of apples and 35pkgs. of preserved fruit; for South Africa, 686pkgs. of dried fruit; for New Zealand, 1,209 cases of oranges, 853 cases of lemons, 1pkg. of preserved fruit, and 3pkgs. plants. Under the Federal Quarantine Act, 908pkgs. of plants, bulbs, seeds, nuts, etc., were examined and admitted from oversea markets. During the month of September, 1913, 21,852bush. of fresh fruits, 8,463 bags of potatoes, 261 bags of onions, 90pkgs. of Swede turnips, 71bush. of sweet potatoes, 2pkgs. of plants, 198doz. cabbages, and 89pkgs. of trees, were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910; of these, 600bush. of bananas were fumigated, and 54bush. of bananas were destroyed, being over-ripe. Under the Federal Commerce Act, 1,404 cases of fresh fruits, 100pkgs. of honey, 42pkgs. of preserved fruit, and 680pkgs. of dried fruit, were exported to oversea markets during the same period. These were distributed as follows:—For London, 100pkgs. of honey, and 10pkgs. of preserved fruit; for Canada, 400pkgs. of dried fruit; for India, 32pkgs. of preserved fruit; for New Zealand, 1,002 cases of oranges, 402 cases of lemons, and 280pkgs. of dried fruit. Under the Federal Quarantine Act, 761pkgs. of plants, bulbs, seeds, nuts, etc., were examined and admitted from oversea markets.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. Place, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

"E.B.," Truro, has a draught stallion very lame in near hind fetlock for three weeks, with hard wrinkles at back of joint, improves and relapses, especially when standing in the stable ; is being fed high to go on his round.

Reply—The horse has greasy heel, which will be difficult to cure. Give Fowler's solution of arsenic, a tablespoonful twice a day in food for a fortnight, stop for a fortnight, and then repeat ; stop high feeding and give a bran mash daily and hay ; exercise or allow loose in yard. It would do him good to have three or four pints of blood taken from the neck vein. Apply the following lotion daily to the leg :—Flowers of sulphur, ½lb. ; slaked lime, 1lb. ; water, 2 quarts.

"F.M.," Myponga, has a filly that broke out in small lumps like blisters after being overheated.

Reply—This condition is sometimes called nettlerash, and arises from a chill upsetting the digestion ; usually it disappears in a little while without treatment, but an ounce of Epsom salts twice daily in food or water will do good, or half an ounce of flowers of sulphur once a day for a few days in the food.

"P.," had an aged mare in good condition, which he found dead, practically disembowelled, no signs of having been gored or torn ; in foal.

Reply—Most probably a stake was the cause of the condition, but if not, the belly wall gave way after an old-standing rupture ; probably there was an attack of flatulent colic also.

" J. F. W.," Macclesfield, has some bought pigs which do not thrive; he suspects worms and asks for a remedy.

Reply—Very possibly worms are the cause of the want of condition, but it would be well to advise the Chief Inspector of Stock and let one of his officers see the pigs. In the meanwhile let each pig have occasionally in milk two ounces of crushed castor seeds; if there are worms this will shift them, and the pigs will eat them readily. Melon seeds may be used instead. Cinders or charcoal in the feed will be found useful as a regular thing. Most pigs will drink up in their wash a teaspoonful of any coal tar disinfectant, such as cyllin; this given occasionally will be found useful. Also an occasional dose of a teaspoonful of flowers of sulphur is a good thing.

" W. G. B.," Leighton, asks if splints are termed an unsoundness, and would they prevent a horse getting a Government veterinary certificate; also, is it any use trying to remove them and what is best to do ?

Reply—Splints are an unsoundness if causing or likely to cause lameness. They are not scheduled as an hereditary unsoundness, and the question of rejection or otherwise would lie with the examining officer. As a rule they are reabsorbed as the horse grows older, but may be much reduced in size by rubbing them briskly with a smooth round stick, such as a piece of broom handle, for five minutes or so daily; care must be taken on the second and third days not to injure the skin, which will be very tender.

" A. A.," Farrell's Flat, has a year-old draught colt with a large fluctuating swelling of the hock, with which he was born. He asks would it be advisable to open the swelling or blister it ?

Reply—As the swelling is probably a distended oil sac it would be very inadvisable to open it, neither would one blister do much good; but if it is well plastered with Stockholm tar and wool, repeated in a month or two as it wears off, it is possible the swelling will be reduced.

" W. F.," wants treatment for lice on cow; he sends specimens.

Reply—The lice are the common cattle lice (*Hæmatopinus eurysternus*). A wash every week with plenty of soft soap and soda will keep them in check, and if the cow is smeared with any cheap oil and sulphur (2 per cent.) she will soon be rid of them.

" C. F. J." asks regarding sheep that are all right in the paddock, but when driven 30 chains or so get cramp, shiver, and fall, some never to rise again. Shortly after death green water runs out of mouth and nose. Forty out of 150 fall and three or four die.

Reply—The sheep have contracted a braxy-like disease, and any movement such as described affects their hearts, as the disease generally is more severe when the sheep are conditioning. Constant movement from paddock to paddock is advisable, but must be done slowly. As a preventive a lick of equal parts of flowers of sulphur, Epsom salts, saltpetre, and three parts fresh bonemeal will be of use. Bleeding at the eye vein will often save the affected ones. The paddocks being infected should be limed or sprayed with sulphate of iron, 1lb. to 40galls. of water.

" S. S.," Meadows, asks if ticks injure pigs inwardly.

Reply—The so-called pig tick is a louse, the largest of the tribe, and it is connected with the transmission of diseases like swine fever, trichinosis, intestinal worms. Spraying with Cooper's dip or other disinfectant, followed by a rub over with any cheap oil, such as train oil, in which a little sulphur is mixed, will get rid of them.

" W. P." has a horse whose sheath swells at this time of year, but otherwise the animal is all right. He asks the reason.

Reply—Certain changes occur in the blood in the spring, and sometimes, as in this case, Nature cannot get rid of the waste matter quickly enough, and it is deposited in soft tissues like the sheath. A little alterative medicine, such as 1oz. flowers of sulphur once a day for a week, generally puts matters right.

" F. G. B.," Pinnaroo, asks for treatment of cow that gives slightly bloody milk three weeks after calving, and if the milk is injurious.

Reply—A cow with a tender udder will often give bloody milk without any disease being present. The udder should be very gently handled, and after milking the quarter from which the blood comes should be anointed with a little glycerine and arnica, 1dr. of arnica to 1oz. glycerine. The cow may also have with advantage 10 drops of vet. tr. arnica in a little water or bran twice a day for a week. Probably the milk is not more injurious than a black pudding, but, like the latter, should be well cooked before use.

" H. H. D.," Proper Bay, asks for remedy for yacca poison, the cows being paralysed. He also asks if the milk is good for use.

Reply—Prevention is better than cure, and cows should be kept off young yacca. As treatment, sulphate of iron, 2drs. ; nux vomica, 2drs. ; flowers of sulphur, ½oz. ; brown sugar, 1oz., given twice daily in a quart of beer or milk, will effect an improvement. The powder may be given in the food when an animal is getting bran and chaff. It is not advisable to use the milk either for human beings or animals ; if it is used it should be boiled for 15 minutes.

" H. W. T.," Maitland, wants a remedy for an old-standing case of scouring in a cow.

Reply—Chronic scouring in a cow is a symptom of many diseases, two of which are highly contagious, namely, tuberculosis and Johne's disease, so that the Chief Inspector of Stock should be advised. Internal parasites also produce the complaint, and in any case slaughter would be the best course to adopt, taking care to bury or burn the carcass.

"G. B.," Snowtown, had a mare heavy in foal that swells about the hock and knee joints, and asks if it is advisable to do anything, if so, what ?

Reply—The swellings are probably only lymphatic, such as often occur during the later months of pregnancy, and as a rule no treatment beyond laxative food is necessary. One or two ounces of Epsom salts in the drinking water daily for a few days may help.

"F.N.," Murbko, has a mare which went stiff on her front legs a few days after foaling.

Reply—The mare has had an attack of founder, or laminitis, and probably has by this time recovered; if not, she should have an ounce of Epsom salts in her drinking water three times a day for a few days.

Coorabie Branch. "A.B." inquires why a number of mares running together, several carrying twin foals, should foal one and retain the other, finally pining away and dying. This followed a case of slipping foal in which the mare eventually died.

Reply—The history of this outbreak is very suggestive of an outbreak of contagious abortion, the germ of which is taken into the system by the mouth or during service. It would be well to send the particulars to the Chief Inspector of Stock, who would, no doubt, instruct an officer to investigate the matter locally.

The same Branch states that a mare has foaled a very large first foal, has no milk, and will have nothing to do with the foal. A day or two after foaling she goes lame in front. They ask is it advisable to breed from her again ?

Reply—The lameness is probably laminitis, which often follows difficult foaling, and would be the cause of want of milk. A foal digests cow's milk if a good pinch of sugar of milk is added to each pint; but under present circumstances it is doubtful if it would pay to hand-rear it. Probably the mare would breed all right, but as it is possible she would be a poor milker, the advice not to use her is sound.

Roberts and Verran Branch. "A.B." inquires why horses turned into a paddock of real good green feed (wheat and oats) go stiff in front and soon recover.

Reply—Any change of feed causes alteration in the power of digestion, and this reacts upon the blood supply of the feet, so that the stiffness is really a mild attack of founder or laminitis. As recovery ensues no treatment is necessary. Probably if they were bled before being turned on to the field the trouble would not occur.

"T.M." has a 4-year-old colt with hard swelling on its left shoulder. He asks for treatment.

Reply—This is probably a fibrous tumor grown around a gland under the skin; the pain on working is due to pressure. The best treatment is to cut it out by making a slit along its hinder edge, and freeing from its attachments with the fingers, cut the fibrous root, and treating it afterwards with tincture of iodine, painting under as well as over the skin.

" R. A.," Gilles Plains, asks if white paint put on the inside of a water trough will harm cattle drinking the water.

Reply—Yes ; it is calculated to give them lead poisoning, bringing on severe diarrhœa and, later, paralysis.

" A. B. H.," Mount Caspar, Port Lincoln, has a young mare with capped hock. He asks for treatment.

Reply—As the capped hock has been in existence for about three months the best thing will be to foment well with hot water twice a day, and every morning rub in a little oleate of mercury, 10 per cent.—a bit about the size of a bean.

HORTICULTURE.

(Replies by Mr. G. QUINN, Horticultural Expert.)

" Interested " wishes to know the best method of storing apples other than the freezing stores.

Reply.—The best method outside of the freezing stores is to provide a room in which the temperature may be fairly well controlled. This is usually most readily obtained by partly excavating underground and covering the structure which is built therein with a thick roofing of thatch underneath a rainproof roof. The apples should not be exposed to conditions which will cause them to wilt, and usually keep better if piled in fairly deep masses, say, 1ft. deep. If the air becomes too dry at any time the floor may be sprinkled lightly with water ; and, although ventilation is desirable, it should not be encouraged during the dry and draughty parts of the day. When packing the apples into the store, the smaller fruits and those known to be the longest keepers should be placed on the bottom of the stacks ; and it is most important that no unsound or damaged specimens be included.

" H. C. M.," Tungkillo asks—(1) When and with what compound should apple and pear trees be sprayed against codlin moth, and what quantities are used ? (2) Is the bluestone and lime mixture, which is sprayed upon apricot trees to check scab on the fruits, likely to injure the trees ? Is tobacco wash more suitable ? (3) Is it too late to spray peach trees against curl leaf ?

Reply.—The best time to begin spraying apple and pear trees against codlin moth is just when the blossoms have fallen. The remedy used is arsenate of lead, at the rate of about 1lb. to about 20galls. of water. This is procurable in jars of various capacity, and costs about 1s. per pound, from ironmongers and seedsmen. The bluestone and lime compound, known as Bordeaux mixture, is quite safe to use for preventing the scab and shothole fungus on apricot trees if it be made carefully, and freshly-burnt lime used.

The first sprayings are given as the blossoms unfold, and the second when the fruits have reached the size of a grape berry. If properly made, you need not fear injury to the trees. Tobacco wash is useful to kill aphides on peach or other trees, but is utterly useless as preventive of fungus diseases such as the apricot scab and shothole. It is quite useless to spray peach trees for the prevention of the curl leaf fungus after the tips of the leaf shoots emerge from the winter buds.

"Oranges" wishes to know— (1) Average number of cases of oranges that should be given by seven-year-old trees in very good soil, such as that in the valley of the Torrens ? (2) Also average number on good soil such as that on Adelaide Plains ? (3) At what age should such trees be in full bearing ? (4) What is about the cost of planting an orangery, trees 20ft. apart or 110 to the acre ? (5) What should be the yearly cost of cultivation ?

Reply.— (1) Well grown seven-year-old orange trees in alluvial soil should average from two to three cases per tree according to the sort, Navel varieties yielding a lesser quantity. (2) From one to two cases might be expected as an average return from similar trees under the conditions named, but the longevity of the trees under such conditions cannot be guaranteed. (3) The trees should be in full bearing at from 12 to 15 years, according to treatment. (4) The cost of planting per acre is probably from £10 10s. to £15, according to the variety and the ease of preparation of the soil. Navel oranges will cost about £2 10s. per acre more than ordinary types. (5) The actual tillage of the soil should not cost more than 50s. per acre ; but this does not include irrigation, manuring, pruning, and harvesting the crop and destruction of pests. These combined might easily amount to £20 per acre.

"Gardener" wishes to know, as he is about to start an orange nursery— (1) If he should plant the seeds in the place he intends to grow them, or must he transplant the seedlings ? (2) Do the seeds require any special treatment ? (3) How long will it take before they are ready for grafting ? (4) How long, from the time they are grafted will it be before they are ready for sale ?

Reply.— The freshly removed orange seeds are sown in a specially prepared bed usually sunken about 3in. below the surface, and a border of boards put around about 1ft. high. A screen of calico is usually used as a cover over these beds. The seeds are sown about 1in. apart, broadcast, and covered about 1in. deep with loose compost. The surface of the bed must be level, and water is best applied with a watering-can having a fine rose. The cover is kept on until germination takes place, and is then only used to keep off excessive rain, sunheat, or frost ; and during mild days it is not used. The seeds are sown in the springtime, and the young seedlings set out in the nursery bed about one year later. A proportion of them will be ready for budding in the same summer or early autumn, but the tops are not cut off to start the buds into growth until the following spring. Some of the most advanced in growth will be ready to transplant into the orchard the following autumn, say, 30 months from sowing the seeds; but the majority are not ready until the next springtime, which means three years from the sowing of the seeds.

POULTRY.

(Replies by Mr. D. F. LAURIE, Poultry Expert.)

As a rule correspondents writing for advice on poultry ailments forward very little information, and it is therefore impossible to diagnose some of the cases. The following should be noted or mentioned when writing:—*Vermin.*—If poultry ticks, red mites, feather lice are present. *Housing.*—Describe the houses, yards, &c. *Feeding.*—Give full particulars and also state the quality of the food. *Water Supply*, also receptacles for same. *Symptoms.*—Give fully the symptoms as they appear to you; then describe the condition of the bird, whether fat or thin. Describe the nature and color of the droppings. Examine the vent and see if feathers are matted with excrement, or if other abnormal conditions are present. Examine the eyes and state if normal or inflamed. Look in the mouth and on the tongue round opening of windpipe and report if any ulcers or masses of cheesy-yellow appearance are to be seen. Any other conditions which are not normal.

"G. T.," Geranium, reports scabs or warts on head and eye; fowls mope about.

Reply.—This trouble is generally known as chicken pox, is infectious, but seldom causes great mortality. Isolate all affected birds. Bathe the parts in warm vinegar and water, equal parts, dry with a soft cloth, then apply carbolised glycerine (one part pure carbolic, 15 parts glycerine). Use Epsom salts in the drinking water—a packet to each 20 adult fowls.

"E. N.," Sevenhills, writes—I have lost, now and then, a hen from the following disease or, rather, symptoms:—They go about without any energy in them, will not eat or drink, and their comb turns quite pale—this last mentioned symptom is the most conspicuous. Otherwise they look right enough; eyes quite clear, no matter issuing from nostrils.

Reply.—The symptoms, as described, indicate the presence of internal parasites, *i.e.*, round worms, probably of the species *Heterakis*. Numerous cases have been reported this year, and at one period the trouble was in the nature of an epidemic. Treatment is as follows:—Fast the birds for 24 hours and give water to drink but no food. Obtain from a chemist the following powder:—Santonine, one part; ground areca nut, seven parts—by weight. For the flock—For each 20 adult birds add to dry bran and pollard a heaped teaspoonful of the powder and mix thoroughly; then moisten the whole to a crumbly mass. Use enough bran and pollard to give the birds a short feed only. They may be fed as usual in, say, one hour, after the above. For single birds—Seven (7) grains of the powder mixed with pollard or grease to make a pill. Unfortunately the world's supply of santonine is in few hands, and the price has increased very heavily during recent years. This worm powder has stood the test of time, and I am still advising its use in preference to other vermicides, despite its price.

"W. S. H.," Yarcowie, asks particulars for building a house to accommodate 200 fowls, and remarks that he has been told that high perches are injurious.

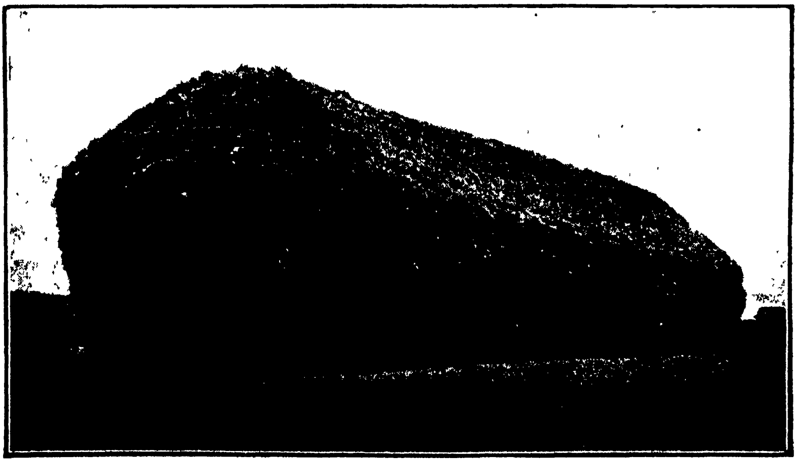
Reply.—A house 20ft. long by 15ft. wide, 8ft. high in front and 6ft. at the back will provide roosting accommodation for 200 fowls ; but must be just twice as long if to be used as a confined scratching-shed house. Use sawn gum or jarrah for the posts—corner posts 3in. x 3in., others 3in. x 2in. The roof, back, and ends must be of corrugated iron. For the roof use two sheets each 8ft., this will allow a 6in. lap in the middle and an overhang at the back. The front should have a galvanized iron windbreak extending 2ft. above ground level. The rest of the front should be enclosed with wire netting and have a door 3ft. wide. Seven perches, 3in. x 2in. jarrah, the top corners rounded off, will provide sufficient roosting accommodation, but must be placed on one level—about 30in. above the ground and about 1ft. 3in. apart. This house should stand in a fox-proof enclosure. If made large enough the breeding yards, cockerel pens, and chicken-rearing yards and houses could also be built in this fox-proof enclosure.

"B. C.," Mallala, writes asking how to prepare an Andalusian cockerel for show as regards food.

Reply.—Without discussing the question of poultry shows and their bearing upon the commercial side of the industry, I must point out that I have no time to advise on matters such as preparing birds for shows. In commercial poultry keeping the results I am endeavoring to promote are good financial returns. In this State there is little profit in showing birds beyond the pleasure of winning a prize. It may be definitely stated that only sound food in proper quantity should be given to any birds, and the use of any special forcing foods or nostrums is to be deprecated. The shading and special housing necessary for show birds creates artificial conditions as opposed to commercial usages.

"T. K.," Pyap, writes detailing his experiences in incubation and asking information as to why fully-matured chickens die before hatching and why others are crippled.

Reply.—The following are contributory to want of success :—(1) Faulty construction of machine—even in the best makes an occasional machine is unsatisfactory. (2) Incorrect thermometer. Very often the mercury column in the thermometer breaks and an apparently insignificant part of the mercury escapes to the top of the tube, where it is unnoticed because the diameter of the tube there is expanded. In consequence the thermometer may be registering several degrees less heat than is really the true temperature. (3) Breeding stock in poor condition, or not suitably housed and fed. (4) Eggs too stale. The best results are obtained from eggs not more than a week old; better still if about four days old. (5) Insufficient airing. The eggs should not be turned for the first three days, and it is better not to open the machine. After the third day the eggs should be turned twice daily and allowed to become just cool. The duration of the cooling process may be extended as the process of incubation proceeds. (6) *Moisture.*—Hot air machines, owing to the difference in atmospheric tension, supply their own moisture during normal conditions. It frequently happens that during dry spells, especially in winter, there is a minimum of moisture in the atmosphere, and consequently a shortage in the egg chamber. When the moisture content of the air is too low the moisture of the egg dries out too quickly. The egg shell is chiefly carbonate of lime. The chicken embryo gives off carbon dioxide which, uniting with the moisture evaporated through the pores of the egg shell, attacks the carbonate of lime and leaves only the organic portion. This may be seen by comparing the shell of a fresh egg with that from which a chicken has hatched. Too rapid evaporation of the moisture, therefore, affects this question. Then, again, there is from 47 per cent. to 51 per cent. of water in the yolk, and from 80 per cent. to 86 per cent. in the white. The solids (mineral fats, &c.) are held in chemical combination with the water, and any undue drying out must have a prejudicial effect upon the chick. The normal drying out process, or evaporation, increases the size of the air sac where the air is first directly breathed into the lungs of the chicken before the shell is fractured. In hot air machines use sponges when dry, and in tank machines keep the water trays in all the time.



Haystack, Turretfield.

SOME ECTO-PARASITES OF POULTRY.

By D. F. LAURIE, Government Poultry Expert and Lecturer.

(*Continued from page* 152.)

The *Menopons—Ricinidæ* or *Mallophaga*.

Neumann says, "The menopons (*Menopon*, Nitsch) generally have the head like the two preceding genera (*Trinotons* and *Colpocephales*), but the orbital sinus is absent or very shallow at the part occupied by the eye; and also that where the antennæ are fixed the latter are always short and indistinct. Living on birds of all kinds except the coursers, Piaget has, on two occasions, found them on mammals—one of them, *M. extraneum*, on the guinea pig."

This louse is extremely active and smooth to the touch, and is the species which moves quickly on the fowl and equally so upon the hand, arms, &c., of persons handling infested birds. These are the most numerous of all parasites in this State. Lives on all parts of the bird's body; is active and constantly on the move; is pellivorous, *i.e.*, lives on epidermic productions (scurf, particles of feather, &c.). They may be considered, not as true parasites, but as commensals; although when in numbers they undoubtedly irritate the skin and set up cachetic conditions ending in death. Some male birds and others do not dust themselves freely and the unchecked vermin soon swarm. Large masses, numbering thousands of eggs (nits), mat the feathers, particularly in the region of the vent. It is always advisable to examine the poultry stock, especially the males, as if infested there will be few fertile eggs. Infested birds soon lose weight and become skeletons; this is due to irritation, &c. Ordinary good insect powders freely shaken among the feathers will result in these parasites being destroyed or so affected that they will drop from the birds. The application of kerosine one part and olive oil three parts is effective, but subsequent contact with dust gives the oiled feathers a dirty appearance. Any good dip—kerosine emulsion, 10 per cent.; formalin, 2 per cent.; or coal tar by-products, 2 per cent. to 5 per cent.—will destroy both parasites and eggs.

Menopon Pallidum, Nitsch.

Neumann says, "The head is slightly angular in front and somewhat crescent-shaped, the temples being bent downwards; the latter are shorter and rounded, with four bristles and some hairs ; there is no appendage to the second article of the antennæ. The thorax is longer than the head in the female ; they are equal in size in the male. The legs are strong and hairy. The abdomen is an elongated oval in the female, narrower and longer in the male, with a single series of bristles on each segment. The general tint is a dirty-yellow, the spots on the abdomen being a bright fawn color. The female is 1·7mm. long and the male 1·8mm.

Plate I.

Plate II.

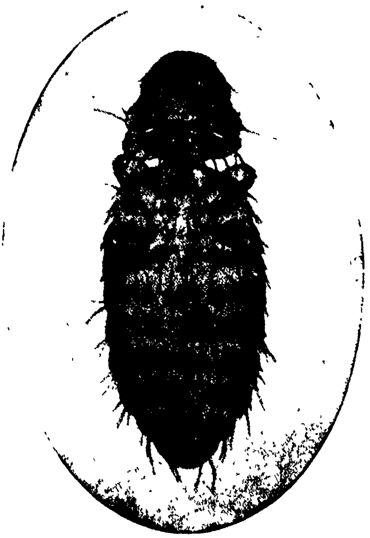


Plate III.

Plate IV.

PLATE V.

PLATE VI.

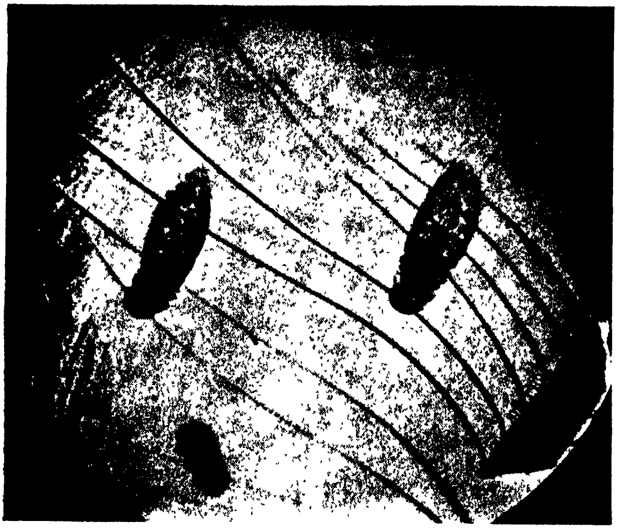


PLATE VII.

Menopon Biseriatum, Piaget.

"This is rendered distinct from the preceding by its head, which is distinctly parabolic in front, by the presence of two series of bristles on each ring of the abdomen, and by the eighth segment, which in the male is elongated and narrow. It has the same tints as the preceding. The female is 2.7mm. in length, the male 2·9mm. This species lives also on the turkey, pheasant, and pigeon."

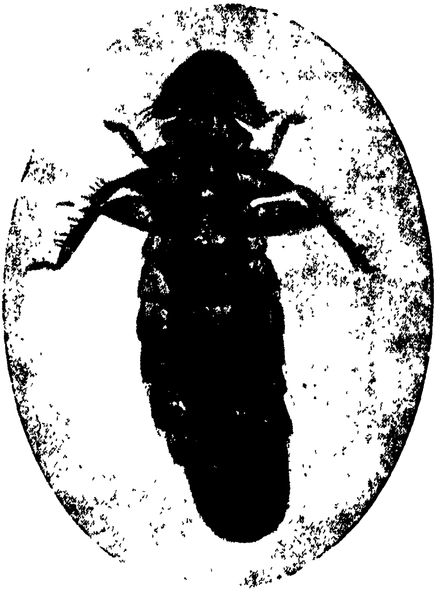


Plate I.

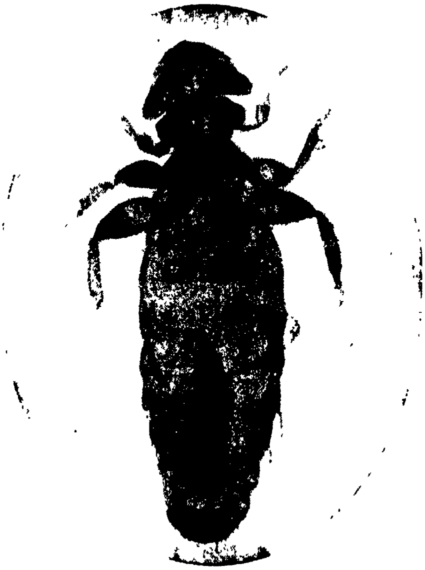
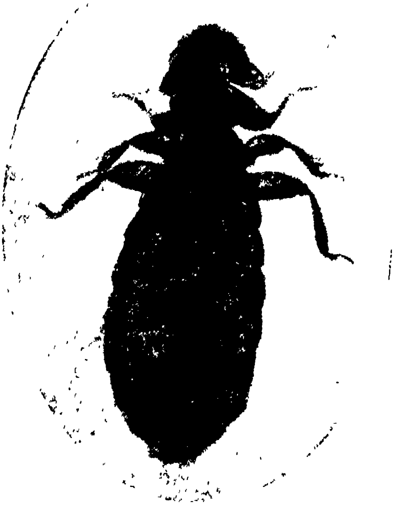


Plate II



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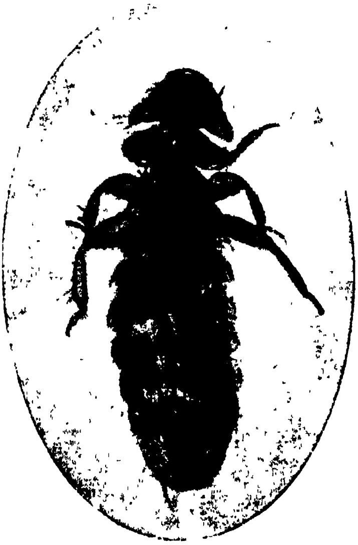

Plate IV.

PLATE V.

PLATE VI.

Plate VII.

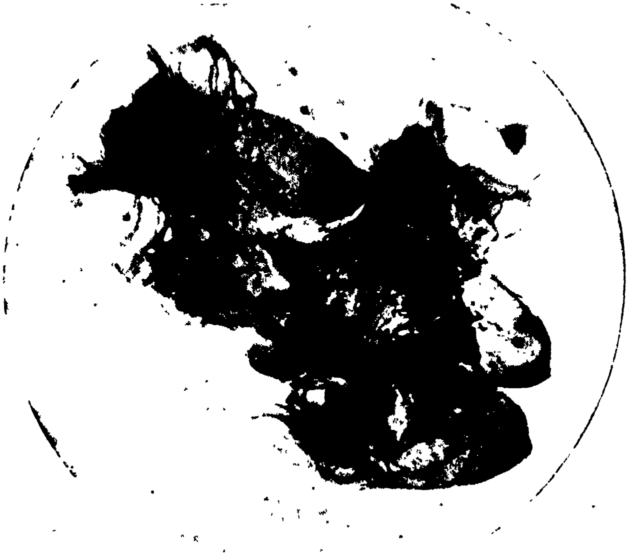

Plate VIII.

PLATE IX.

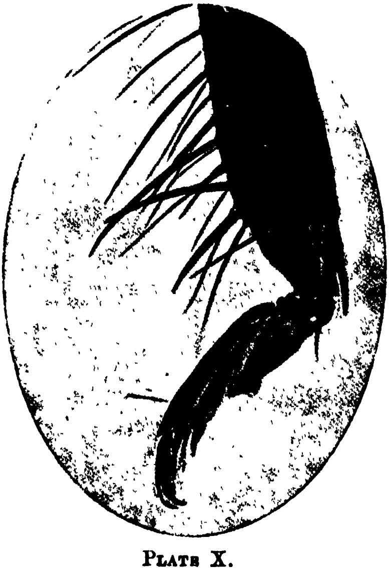

PLATE X.

LIST OF PLATES.

Menopon pallidum (Nitzsch).

PLATE I.	Ventral view	x 67·2
PLATE II.	Dorsal view	x 67·2
PLATE III.	Ventral view	x 57·6
PLATE IV.	Dorsal view—Showing markings and caecal contents	x 38·4
PLATE V.	Dorsal view—Showing markings and caecal contents	x 38·4
PLATE VI.	Dorsal view—Showing markings and caecal contents	x 50·0
PLATE VII.	On feathers—Piece of feather and parasites	x 24·0

Menopon biseriatum (Piaget).

PLATE I.	Male. Dorsal view	x 41·2
PLATE II.	Male. Ventral view	x 40·3
PLATE III.	Female. Dorsal view	x 33·6
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PLATE VII.	Feathers bearing masses of eggs (nits)	Natural size
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PLATE IX.	Ovum—Showing attachments (seat of ovum)	x 130·0
PLATE X.	Tarsus—Shows hooklets	x 214·0

(Illustrations from mounts prepared and photographed by author.)

THE POULTRY INDUSTRY.

STATISTICS FOR 1912.

The following return, showing the number of poultry and value of production for the year 1912, has been compiled by the Government Statist (Mr. L. H. Sholl, C.M.G.) from farmers' returns.

Divisions of State.	Live Poultry on Farm Holdings.				Value of Poultry Raised and Eggs Produced.
	Fowls.	Ducks.	Geese.	Turkeys.	1912.
	No.	No.	No.	No.	£
I. Central	782,942	32,779	10,810	15,542	304,930
II. Lower North	245,944	6,255	2,713	9,306	99,161
III. Upper North	115,695	3,099	2,961	8,908	46,412
IV. South-Eastern	137,090	8,208	2,054	5,876	53,652
V. Western	96,272	2,824	771	4,012	35,925
Remainder of State	3,937	175	47	176	1,409
Total	1,381,880	53,340	19,356	43,920	541,489

LUCERNE LEAF SPOT DISEASE.

By T. G. B. Osborn, M.Sc., Professor of Botany and Vegetable Pathology, Adelaide University.

The disease known as the leaf spot of lucerne is generally distributed in all countries where lucerne (*Medicago sativa*) is grown. It is recorded from New South Wales* and Victoria, and in December last specimens were collected from the department's farm at Turretfield. Although in most cases the disease does not appear to cause much damage in South Australia, the importance of the crop it infects is so great that a short account of it may be generally useful.

APPEARANCE.

As in most fungus diseases the infection of the plant is not obvious until a late stage in the course of the disease. The instances in which the actual diseased tissue of a plant can be cured are, for practical purposes, negligible. The treatment of plant diseases in the present state of our knowledge must be preventive rather than curative. It therefore behoves all growers to watch for the earliest signs of an outbreak, to check that, and so to save the remainder of the crop and to give the succeeding crops a better chance of escaping infection.

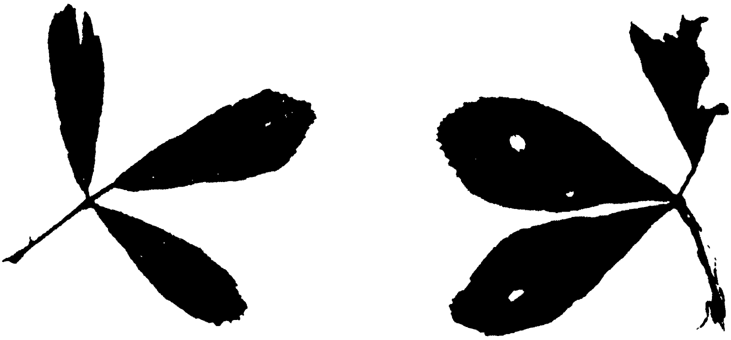

FIG. 1. Photograph of two leaves infected with leaf spot disease. The photographs show the numerous brown areas (see Fig 4). x 2.

In the case of lucerne leaf spot, brown patches appear usually on the lower leaves of the plant (Fig. 1). The individual spot is hardly as large as a pin's head, but there may be so many on the leaf that it appears brownish. The infected leaves turn yellow, and are often shed in such numbers that in cases of severe attacks the plants are almost defoliated. The result is that the value of the crop is reduced, since the hay has a larger percentage of stems. The total yield of the lucerne plot is also decreased, since the vitality of the plants is lowered by the loss of the leaves. An attack of leaf spot is usually noticeable on the first growth of the lucerne plants in early summer. In many cases after the first cut, especially if this has been made before many of the infected leaves have fallen, the disease is not very noticeable. In the United States of America the greatest damage is stated to occur in hot, dry seasons.

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*Dep. Agric., N.S.W., Farmer's Bull., No. 37, Oct., 1910.

PARASITE.

The fungus causing the disease is known as *Pseudopeziza medicaginis* (Lib.) Sacc. The spores of the fungus germinate upon the leaf surface, and the fungus threads (*hyphæ*) enter the tissue, which they kill within a restricted area—the brown spot. The majority of the spots are on the upper surface of the leaf, though they are not infrequent upon the lower. Occasional pustules are to be found upon the stems, in which position they are usually elliptical. It is probable that each spot is the result of a separate infection, as the vegetative body of the fungus (*mycelium*) is limited to the brown areas and does not appear to ramify throughout the leaf. The reproductive organs are developed from a mass of fungus tissue that is formed just below the outermost layer or the epidermis of the leaf (Fig. 2). These consist of numerous little sacs (*asci*), each containing eight spores (Fig. 3). Standing erect between the *asci* are other fungus threads that do not produce spores. When the spores are formed, the leaf surface above the pustule is ruptured (Fig. 4) and the *asci* are exposed. The thin walls of these are soon broken, and the spores

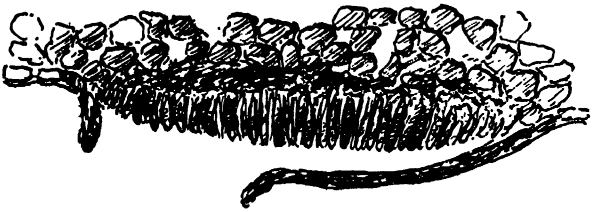


FIG. 2. Cross section of a portion of a lucerne leaf, showing the fructification of the leaf spot fungus breaking through the epidermis, exposing the spore sacs (*asci*). The leaf cells around are dead and discolored. Magnified.

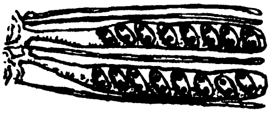


FIG. 3. Two *asci*, each containing eight spores. Highly magnified.

are thus freed. They are then either blown on to other leaves or splashed upon them in drops of water.

CONTROL.

The most practical treatment of the disease is frequent cutting. If the hay is removed as soon as possible from the ground the number of dead leaves left behind will be comparatively small. Thus most of the spores will be removed, and the new growth will be relatively free from infection. This was found to be the case on the Department's farm at Turretfield. If, in spite of the treatment, the disease gets the upper hand, it has been recommended that the crop should be cut and the hay allowed to become thoroughly dry, when it should be burned as it lies over the plot. The area might even have a covering of straw placed over it as well as the hay, so as to secure a good burn.

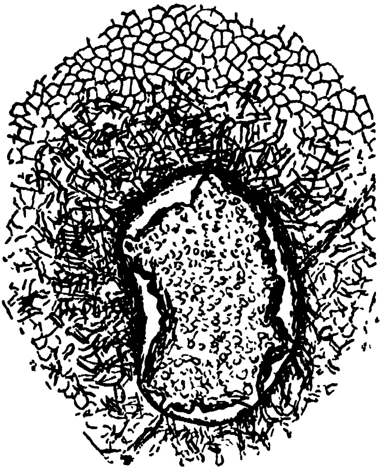


FIG. 4. Surface view of a spot, showing the fructification breaking through the epidermis of the leaf. The *hyphæ* of the fungus can be seen amongst the cells around the fructification. Magnified.

Leaf spot disease is stated to occur in regions where lucerne has not been grown before. The explanation that has been offered is that the spores may be conveyed to the place in the soil used to inoculate the ground with nodule bacteria, or that they may have come with the seed.

A very similar leaf spot disease of clover is produced by *Pseudopeziza trifolii* (Fckl), but it is not known whether infection will occur from clover, &c., to lucerne.

DISEASES OF FARM ANIMALS.

TREATMENT OF WOUNDS.

By C. A. Loxton, G.M.V.C., Government Veterinary Surgeon.

A wound may be defined as an injury to any part of the body caused by violence and resulting in a division of the soft parts. Wounds vary considerably in their gravity upon their extent, situation, and upon the structures injured, extensive flesh wounds often healing readily, while apparently insignificant wounds, such as punctured wounds of joints, often lead to permanent injury—anchylosis, or stiffening of the joint. Those most commonly met with are classed as incised, punctured, lacerated, and contused wounds.

Incised Wounds.

These are clean cuts made with a sharp body such as a knife, the tissues being evenly divided without any loss of substance. As a rule they bleed freely, and where the wound is across a muscle it has a tendency to gape widely. Incised wounds when properly treated usually heal readily, as there is no loss of tissue to make up in the process.

Punctured Wounds.

Punctured wounds are those produced by sharp, penetrating objects, such as stakes, nails, stable forks, &c. Wounds of the feet from treading on nails are of very frequent occurrence, and require special treatment. (*See* p. 847, vol. XVI.) With deep punctured wounds it is difficult to provide for drainage, and the discharges have a tendency to burrow in the tissues. The orifice of the wound being usually quite small, foreign bodies may remain a long time in the wound without being suspected.

Punctured wounds may be regarded as the most dangerous of all, and are most liable of all wounds to be followed by tetanus.

Lacerated Wounds.

Lacerated wounds result when the tissues are torn rather than cut. Barbed wire injuries come under this heading. They do not bleed so freely nor heal so readily as incised wounds, the tearing of the blood vessels preventing bleeding, and the injury to the tissues retarding healing.

CONTUSED WOUNDS.

Contused wounds are caused by blows from blunt objects, falls, &c. In addition to the wound there is bruising of the tissue. If the injury is severe it may lead to sloughing (mortification) of the bruised parts.

HEALING OF WOUNDS.

The manner in which a wound heals depends upon its nature. Where incised wounds are absolutely clean and the cut surfaces are brought close together, there may be direct joining of the cut surfaces and healing in a few days. In the domestic animals conditions are not favorable to this form of healing, and the more common process to take place is healing by granulation, a growth of new tissue taking place and gradually filling up the wound. After a time the new tissue contracts and a permanent cicatrix (scar) results. If two granulating surfaces are brought together and maintained in that position, union will take place much more rapidly than if the wound is allowed to fill up from the bottom.

Healing under a scab takes place when the fluids oozing from the wound dry on its surface and form a protective covering, under which the process of repair takes place.

TREATMENT OF WOUNDS.

The conditions favorable to the rapid healing of wounds are as follow :—Arrest of bleeding. Absolute cleanliness. The edges of the wound to be brought together and maintained in that position. The injured part to be kept in a state of rest.

The first point to be attended to is to stop the bleeding if it is at all serious. This may be accomplished by means of torsion ligature pressure, or by the application of cold ; other means, such as the hot iron, the application of styptics such as perchloride of iron being sometimes used. In cases of severe bleeding from wounds of the limbs a tourniquet may be applied by tying a cord round the leg loosely and then passing a stick through and twisting it until it is tight enough to stop the circulation. This is only a temporary measure until the blood vessel can be secured by other means. Torsion consists in twisting the blood vessel by means of forceps, and is the usual way of stopping bleeding from small vessels. Large vessels should be secured by means of a ligature, by grasping the end of the vessel with a pair of forceps, passing a piece of silk thread or other ligature material round the vessel, and tying it securely. When it is impossible to reach the bleeding vessel, it may be necessary to include a mass of tissue in the ligature. Where other means are not available, a bleeding vessel may be secured by passing a thread under it with a suture needle and tying the two ends. An easy means of stopping bleeding is by pressure, applied by placing a pad of wool over the wound and bandaging it firmly in position. The application of cold water is useful only for checking capillary bleeding, and even then its action is not certain.

Absolute Cleanliness.—This refers not only to the wound itself, but to everything used in connection with it, and includes the hands of the attendant, instruments, needles, silk, &c., which should all be disinfected before use. After the hemorrhage has ceased, and before the edges of the wound are brought together, an examination should be made for any foreign material, dirt, grit, &c., which should be removed, and the wound thoroughly cleansed with a disinfectant dressing. This may be a weak solution of carbolic acid, lysol, cyllin, or other antiseptic.

The edges of the wound are brought together by means of sutures (stitches), pins, plasters, or bandages. This applies more particularly to incised wounds, contused and punctured wounds not being suitable for such treatment. Where stitches are inserted they may be continued from end to end of the wound (continuous), or separate stitches (interrupted) may be used. The latter are most useful, and are made by passing the needle carrying the thread through the opposing lips of the wound, drawing the ends together and tying them firmly in a reef knot towards one side of the wound. After tying, the ends of the threads are cut off short and the knots should lie on one side and not on the wound. Occasionally pins are used by passing them through the lips of the wound and carrying a thread round the ends of the pin in the form of a figure eight. Plasters have a very limited use in the treatment of wounds of animals, and are very little used. Bandages are useful in the case of wounds of the limbs, especially where it is desirable to check the movement of the part, in such cases as punctured wounds of joints (open joint).

As long as the process of healing is going on satisfactorily, the wound requires only cleansing and dressing with antiseptic lotion. Dry antiseptic powders, such as zinc oxide, boracic acid, &c., are also useful in drying up discharges, and are particularly useful in the case of open wounds. Should a wound become inflamed and painful, it must be carefully examined, and if necessary the stitches cut so as to allow efficient disinfection and the escape of discharges. It is advisable to clip the hair from the edges of all wounds to facilitate dressing.

Wounds healing by granulation (proud flesh) should not be checked by the use of caustic preparations like sulphate of copper (bluestone), unless it is excessive in amount. The application of dry antiseptic powders will usually be sufficient, but some wounds, such as those of the lower parts of the limbs, often have a tendency to excessive granulation, and may be covered with a dry dressing and a bandage applied. If this is not sufficient the mass of granulation tissue may be removed with the knife and a pad of cotton wool bandaged over it if the bleeding is severe.

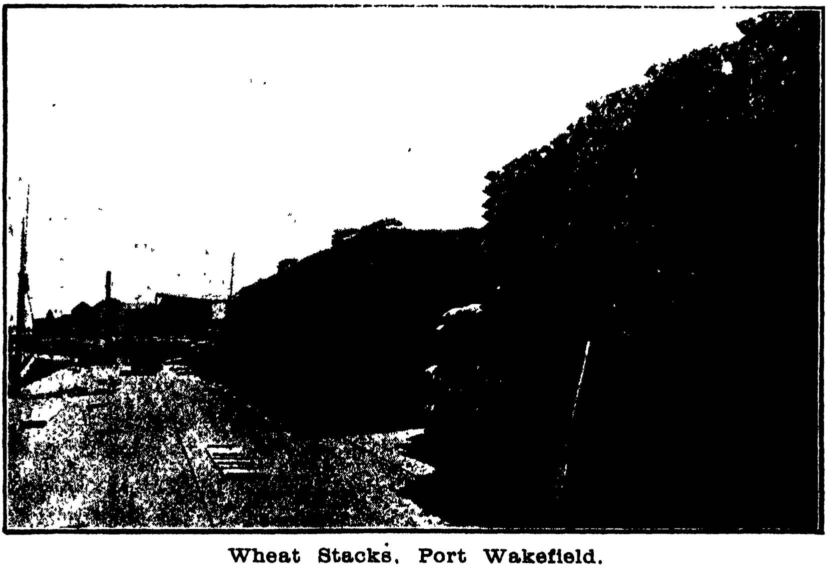
Where wounds fail to heal, and continue discharging in spite of antiseptic treatment, the probability of a foreign body in the wound must be thought of and an examination should be made. It must be noted, however, that great harm may be done in the case of wounds in the immediate vicinity of joints by injudicious probing.

CONSTITUTIONAL TREATMENT.

Constitutional treatment includes attention to the state of the bowels, cooling and easily-digested food, and good surroundings, and should be observed in the treatment of all except minor injuries.

NOTE.—The next article will deal with wounds requiring special treatment.

* * *



Wheat Stacks, Port Wakefield.

SPRAYING TESTS AGAINST POTATO BLIGHT.

(*Phytophthora infestans, D.B.*)

By GEORGE QUINN, Horticultural Instructor.

Since this disease appeared in South Australia and attacked the potato crops with such sudden virulence about four years ago, this department has made several attempts to demonstrate the protective value of copper compounds used as sprays upon the growing crops. In the *Journal of Agriculture* for October, 1912, the results of a series carried out in the Mount Gambier district were given, and following upon their inconclusive character another lot was planned in the South-East for the summer of 1912-13. In the meantime, however, at the request of the Campbelltown Branch of the Market Gardeners' and Fruitgrowers' Association, it was decided to arrange for a demonstration in that district, where the potatoes, owing to the mildness of the climate, are grown during the winter season. Mr. Edward Naughton, of Paradise Park, kindly placed a small field at the disposal of the association, and, assisted by the officers of the department, carried out the spraying with considerable skill and enthusiasm.

The plot of ground consisted of about one acre in area, containing 40 rows of plants of New Zealand Pink Eye. They were planted on June 28th, 1912, with good even seed, and the sprayed plots were dug on October 31st, just four months later. Those unsprayed were dug a week afterwards. The rows which were planted north and south were divided into six sections—No. 1 on the western exposed border containing eight rows was sprayed with Burgundy mixture three times, of a strength of 8lbs bluestone, 14lbs. washing soda, to 40galls. of water; No. 2, containing four rows, remained unsprayed as a check; No. 3 was sprayed with a Burgundy mixture of half the above strength, viz., 4-7-40; No. 4, also containing eight rows, was dressed with a Bordeaux spray made of 8lbs. bluestone, 8lbs. quicklime, in 40galls. of water; No. 5, containing four rows, was also kept as an unsprayed check; whilst No. 6, made up of eight rows, was sprayed with Bordeaux mixture of half the strength given to No. 4, viz., 4-4-40. In each case three sprayings were applied. Owing to the rows being set closer together than such widths as the Doncaster horse-power outfit was made to bestride, the gearing had to be discarded and a handle fitted to the pump, so that the spraying was done by handpower. Notwithstanding this, a good cloud of spray was maintained at the rate of 80galls. to the acre.

As previously remarked, the plots were in an exposed position, and after the first spraying—which was applied on the evening of a windy day—the foliage of the plants in the sprayed plots assumed a rusty appearance, of which they never were afterwards free. Although the presence of Irish blight could be detected in these test plots and adjoining fields, it never developed the virulence of an epidemic, and Mr. Naughton failed to record any diseased tubers. This, I believe, is to be attributed to the drying cold winds which invariably followed each fall of rain during the growing period.

In forwarding the tabulated results given below, Mr. Naughton, to whom I am much indebted in connection with this trial, tersely remarked, "As the unsprayed rows took a week longer to mature, the yield from them should be much greater than from the sprayed portion."

Results of Spraying Potatoes against Irish Blight at Mr. E. Naughton's, Paradise Park, 1912.

No. of Plot.	No. of Rows.	Sprayed Three Times with—	Yield of Large Potatoes.			Yield of Small Potatoes.		
			C.	Q.	L.	C.	Q.	L.
1	8	8.14.40 Burgundy	15	1	0	1	1	0
2	4	Unsprayed	8	0	0	0	2	11
3	8	4.7.40 Burgundy	15	2	14	1	1	20
4	8	8.8.40 Bordeaux	16	1	0	1	1	13
5	4	Unsprayed	9	2	0	0	2	0
6	8	4.4.40 Bordeaux	17	3	0	1	1	15

Summary.

No. of Rows.		Yield of Large Potatoes.			Yield of Small Potatoes.		
		C.	Q.	L.	C.	Q.	L.
16	Sprayed with Burgundy	30	3	4	2	2	20
16	Sprayed with Bordeaux	34	0	0	3	1	0
8	Unsprayed	17	2	0	1	0	11

Compared with yields from the unsprayed check rows these figures indicate the negligible gain of 6lbs. in favor of the Bordeaux sprayed plots, and a deficiency of 3cwts. 2qrs. 26lbs. in those sprayed with Burgundy. These results are somewhat difficult to reconcile, but for the fact previously mentioned that the Burgundy plots were apparently injured at the first spraying, either by the wind or the action of the spray following upon the battered stems and foliage.

Results of Mount Gambier Spraying Tests in Season 1912-13.

These were carried out by the Inspector of Orchards for the South-East (Mr. R. Fowler) in careful detail.

As mentioned in the appended report, they are contradictory and inconclusive. Whilst it is very fortunate for the potato-growers of the State that the Irish blight should persistently absent itself from localities where trials are being carried out, yet it is impossible to foretell the nature of the season—in so far as its suitability to the propagation of the disease is concerned—when the first sprayings are given.

Under these circumstances, remedial treatment of this character always partakes more or less of the element of a gamble against possibilities.

In reviewing the history of this disease in climates possessing a dry atmosphere anyway approaching our own, it is very problematical whether, in the long run of years, it will pay to spray potatoes against Irish blight if the crops be grown during the summer months.

REPORT BY INSPECTOR R. FOWLER ON TESTS AT MOUNT GAMBIER.

As in the previous test carried out last season, four plots were chosen, though this time only half an acre instead of one acre in extent, owing to the difficulty of getting suitable plots large enough planted with the same variety of seed.

The plots were again all late-grown potatoes, and were grown by the following growers, Messrs. D. McGillivray, Buchanan Bros., F. Webster, and W. Higgs, and were situated in different parts of the district, that of Mr. McGillivray's being on a block of the recently subdivided Moorak Estate.

The spraying was carried out under fairly favorable weather conditions, though the ground was rather too dry, and in several plots being of a very snuffy nature the wheels of the machine raised such a cloud of dust that the plants were smothered, the dust sticking to the damp leaves. The growing period right through was a very dry one, so there was very slight chance of Irish blight developing in the tops, and I could never find any trace of it in the foliage.

The Doncaster machine worked fairly well, and the improvements effected since it was used in this district last season greatly added to its efficiency.

I visited the plots several times during the season, but only in Mr. McGillivray's was there any marked difference in the foliage between the sprayed and unsprayed ; and in this plot it was very marked, the sprayed plants retaining their green color and growing much stronger and longer than the unsprayed. When the potatoes were dug, however, the results were not so noticeable, the yields being rather poor on account of the very dry season.

Messrs. Buchanan Bros.'s plots were at one time looking very healthy and vigorous, and were an even lot of plants, but soon after the third spraying a very severe frost occurred, and this cut the plots unevenly, so that the figures from this test are of little value, as the plots least damaged by the frost gave the best results. Mr. Webster's plots were unfortunately rather stunted plants, and for some reason never made any satisfactory growth. No. 1 plot was right alongside one of the main roads of the district, and caught a considerable amount of dust. This appears to have had a marked effect on the crop from this plot. The same remark applies to Plot No. 1 in Messrs. Buchanan's. Mr. Higgs' plots were very late grown, and only received their first spraying when the others were done the second time. The plants in these plots grew very luxuriantly, as they caught the rain just at the right time. These were only sprayed twice, as it was so late in the season and there was some difficulty in getting the work done. I did not at any time during the growing period notice any traces of Irish blight in this field, but on being dug I found that blight had developed in the tubers to a slight extent. I am, however, inclined to think, from the fact that in nearly every instance the disease attacked the tubers at the stem end, that the development was under ground from the seed tuber, and not from the foliage above; so that if this surmise be correct, spraying would not be of much use. There was no indication of the foliage being cut down, and the disease appeared slightly in the tubers right through the whole field.

I have to again thank the growers concerned for the assistance given in carrying out the work and for placing their fields at my disposal, and must express my disappointment that the results are not more satisfactory to them from a financial point of view ; but in this, as in the previous test, the main object of the experiment was negatived by the fact that owing to unfavorable climatic conditions no Irish blight fungus developed in the potato haulms. From the point of view of general benefit from the copper sprays, the results this time are not so satisfactory as in the last test, when from all the sprayed plots the extra returns more than paid for the cost of the spraying.

The figures 1.1¾.5 or 10 Burgundy mean 1lb. bluestone, 1¾lbs. washing soda to 5galls. or 10galls. of water; and similarly figures 1.1.5 or 10 Bordeaux mean 1lb. bluestone, 1lb. quicklime in 5galls. or 10galls. of water, as the case may be.

The following are the details of the tests :—

Mr. D. McGillivray's Plot, Dug in June—Sprayed three times, December 18th, 1912 ; *January 9th,* 1913 ; *February 6th,* 1913.

Plot			Large. Bags.	Small. Bags.
No. 1.	14 rows	—Sprayed three times with 1·1¾·5 Burgundy returned ..	29	2
" 2	"	Unsprayed, as check plot	24	3
" 3	"	Sprayed three times with 1.1¾.10 Brgndy. mix. returned	30	3
" 4	"	Unsprayed	24	3
" 5	"	Sprayed three times with 1.1.5 Bordeaux mix. returned	27	3
" 6	"	Unsprayed	23	3
" 7	"	Sprayed three times with 1.1.10 Bordeaux mix. returned	21	3
" 8	"	Unsprayed	17	3

	Large.	Small.	Total.
Totals from four sprayed plots, 2 acres	107	11	118
Totals from four unsprayed plots, 2 acres	88	12	100
	19	-1	18

Apparent gain 18 bags, approx. 1 ton 5cwts.

Messrs. Buchanan Bros.' Plot, Dug in June—Sprayed three times, December 19th, 1912 ; *January* 11*th,* 1913 ; *February* 5*th,* 1913.

Plot			Large. Bags.	Small. Bags.
No. 1.	16 rows	—Sprayed three times with 1.1¾.5 Brgndy. mix. returned	16	11
" 2	"	Unsprayed	25	12
" 3	"	Sprayed three times with 1.1¾.10 Brgndy. mix. returned	32	11
" 4	"	Unsprayed	39	9
" 5	"	Sprayed three times with 1.1.5 Bordeaux mix. returned	37	9
" 6	"	Unsprayed	41	7
" 7	"	Sprayed three times with 1.1.10 Bordeaux mix. returned	43	9
" 8	"	Unsprayed	42	8

	Large.	Small.	Total.
Totals from four sprayed plots, 2 acres	128	40	168
Totals from four unsprayed plots, 2 acres	157	36	193
	- 29	4	25

Apparent loss, approx. difference 25 bags, 1 ton 11cwts.

Mr. F. Webster's Plot, Dug end of May—Sprayed three times, December 31*st* ; *January* 7*th,* 1913 ; *February* 8*th,* 1913 (40*galls. each time.*)

Plot			Large. Bags.	Small. Bags.
No. 1.	14 rows	—Sprayed three times with 1.1¾.5 Brgndy. mix. returned	11	4
" 2	"	Unsprayed	18	4
" 3	"	Sprayed three times with 1.1¾.10 Brgndy. mix. returned	16	4
" 4	"	Unsprayed	12	4
" 5	"	Sprayed three times with 1.1.5 Bordeaux mix. returned	15	4
" 6	"	Unsprayed	11	4
" 7	"	Sprayed three times with 1.1.10 Bordeaux mix. returned	15	4
" 8	"	Unsprayed	13	4

	Large.	Small.	Total.
Totals from four sprayed plots, 2 acres	57	16	73
Totals from four unsprayed plots, 2 acres	54	16	70
	3	—	3

Apparent gain three bags, approx. 4cwts.

Mr. W. Higgs' Plot, Dug in July—Sprayed twice, January 8*th,* 1913 ; *February* 13*th,* 1913.

Plot			Large. Bags.	Small. Bags.
No. 1.	14 rows	—Sprayed twice with 1.1¾.5 Burgundy mix. returned ..	51	10
" 2	"	Unsprayed	49	12
" 3	"	Sprayed twice with 1.1¾.5 Burgundy mix. returned ..	48	12
" 4	"	Unsprayed	47	11
" 5	"	Sprayed twice with 1.1.5 Bordeaux mixture returned .	49	10
" 6	"	Unsprayed	47	15
" 7	"	Sprayed twice with 1.1.10 Bordeaux mixture returned.	54	12
" 8	"	Unsprayed	56	15

	Large.	Small.
Total from four sprayed plots, 2 acres	202	44
Total from four unsprayed plots, 2 acres	199	53
	3	-9

Apparent loss 6 bags, approx. 8cwts.

It is noticeable in this field that there is a much larger percentage of small and waste in the unsprayed than in the sprayed. The reason for this, perhaps, is that the diseased tubers would be put in with the small. Mr. Higgs had the small and waste from sprayed and unsprayed put into separate heaps, and also large from both put into separate stacks, so that I may get some further information from these plots when these are picked over. I visited the stacks recently, but the disease does not appear to be making any headway just now.

Cost of Spraying.—This worked out much the same as last season. It took 80galls. to the acre plots in 1911-12, and it took 40galls. to the half-acre plots in 1912-13. This is as much as the machine will put out. I do not consider it enough, but think it would more effectually cover the foliage if 100galls. could be put on to the acre. Allowing 80galls. to the acre the cost for materials would be approximately -16lbs. bluestone at 3½d., 4s. 8d.; 28lbs. soda at 8s. cwt., 2s.—total for 1.1¾.5 Burgundy, 6s. 8d.; 16lbs. bluestone at 3½d., 4s. 8d.; 16lbs. lime at 2s. bag, 6d.—total for 1.1.5 Bordeaux, 5s. 2d. For weaker solution half the above amounts.

Time Taken.—With the machine in good working order it took about two hours to do the two acres, actual working time, with mixtures all ready to go into the sprayer.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on September 3rd, there being present Mr. G. R. Laffer (Chairman), Professor Perkins, Col. Rowell, Messrs. C. J. Valentine, C. J. Tuckwell, J. Miller, A. M. Dawkins, and G. G. Nicholls (Secretary).

Sheep-dipping.—The following resolution from the Strathalbyn Branch was tabled:—"That the Government be asked to make it compulsory for all public saleyards where sheep are sold to have a suitable dip placed therein." The Secretary explained that the resolution was the outcome of a movement which had been initiated by the Naracoorte Branch, with a view to make sheep-dipping compulsory throughout the State. The matter was referred to the Chief Inspector of Stock for a report.

Experimental Farm Wanted.—The Green Patch Branch submitted a resolution "That a properly equipped experimental farm on Eyre's Peninsula is necessary, because it is impossible for individual farmers to carry out the experimental and research work involved in solving the many problems to be met. The solution may mean the difference between profitable and unprofitable agricultural occupation of several million acres of land now being opened on Eyre's Peninsula. We therefore ask the Advisory Board to bring our views on this matter before the Minister, and do all else possible for the early establishment of a properly equipped and managed experimental farm on Eyre's Peninsula." The Secretary mentioned that the Minister had recently stated that it was not improbable that an experimental farm would be established in the Minnipa Hill district at some future date. It was decided to refer the matter to the Director of Agriculture.

Constitution of Board.—The Wilkawatt Branch desired that when the next vacancy occurred on the Board a representative of the Pinnaroo district should be elected to fill the position. At the instance of Mr. Dawkins it was agreed to inform the Branch that the members were chosen, not to represent districts, but industries.

Mount Remarkable.—The Mount Remarkable Branch wrote asking the Board to request the Government to resume the forest leases on Mount Remarkable proper, and to bring to account the persons responsible for wilfully setting fire to the timber thereon. While admitting that the timber should not be ruthlessly destroyed, Mr. Tuckwell stated that owing to the roughness of the country it was practically impossible to use it. Matter referred to the Minister for report from the Conservator of Forests.

Outward Wharfage. A copy of the letter bearing on the question of the abolition of outward wharfage was brought under the notice of the Board by the President of the Woolbuyers' Association (Mr. J. W. McGregor). The Chairman desired an expression of opinion from the members whether the communication ought to be considered by the Board, as it seemed to some extent to deal with a political matter. While several members of the Board felt that the importance of the matter to the producers and manufacturers demanded careful consideration, in view of the political aspect of the question, on the motion of Col. Rowell, it was decided merely to receive the letter and inform Mr. McGregor of the position in which the Board was placed.

New Branches.—Approval was given to the formation of the following new Branches, viz.:—Myponga—Messrs. G. Hunt, C. Sampson, M. McGuinness, H. Pengilley, F. Pengilley, L. Boothby, H. Sampson, H. Oldfield, G. Maslin, K. Stephenson, E. Everard, W. Paul, A. Sinclair, F. Stock, A. Stock, H. Stock, C. Forrest, J. Muller, F. Muller, A. Rowley, A. Hooper. North Bundaleer—Messrs. C. E. Smart, A. E. Wood, T. O'Dea, W. Wilson, R. P. Kelly, C. Annesbury, W. Shadporth, P. E. Kelly, M. Dundon, A.

Burton, W. Pollard, M. Cronin, J. Scriven, G. Lambert, W. Martin, H. Wood, J. Burton.

New Members.—The following gentlemen were admitted as members of the Branches shown, viz.:—Clarendon—W. G. Dowling; Beetaloo Valley—L. Reid; Blackwood—M. Baust, A. K. Ashby, C. A. Davis; Strathalbyn—B. Heijus; Bute—W. Buchanan; Arthurton—F. H. Nicholas, G. Staples; Lyndoch—R. Manning, W. Noble; Mallala—D. Argent, W. H. Temby, W. H. Lindsay; Meningie—W. H. Yates, jun., F. A. Daenke; Yorketown—G. H. Hart, C. Anderson, W. Kirsch; Orroroo—F. W. Churcher; Watervale—G. Holder; Georgetown—J. White, C. Wilkins, M. Hynes; Pine Forest—A. H. Dolling, T. H. Edwards; Claypan Bore—I. Dudley; Wirrabara—M. Mahood, H. Jericho; North Booborowie—T. D. Phillips; Shannon—J. Brewer; Berri—J. W. Pedley, C. Melville; Hartley—A. Stein; Wilkawatt—J. Windfield; Riverton—W. E. Blatchford, J. E. Hannaford, A. Mills, H. Mills; Butler—F. J. Dunstan, J. Owen, Y. M. Unvois, W. A. Sedunary; Roberts and Verran—J. C. McCallum; Mangalo—W. J. Deer, C. M. H. Muller; Coomooroo—W. Barber; Monarto South—B. B. Paech; Borrika—E. R. Miel, J. E. Maycock, G. Miel; Gawler River—E. White, E. H. Mitchell, S. Pederick, W. Roediger; Two Wells—J. W. Hart; Penola—R. Howard; Mount Barker—A. Watson, A. M. Coppin, W. Wibbley, B. Fuller, G. R. Jones, C. Miels, W. Jacobs; Canowie Belt—J. Henschke, H. Coles, A. Brooks, J. O'Mahoney, F. Heinrich; Coonawarra—W. Mudge, C. Skinner; Monteith—C. J. Morris, J. A. Wytken, T. G. Clark; Julia—D. Hombsch, H. Hyde, J. Jaffer; Sutherlands—P. T. Gehling; Lameroo—H. W. Dragomueller, P. Tink; Woodside—G. Sutherland; Mitchell—A. E. Howell, J. Sampson, D. Ness, S. Sinapins, M. McCormick, G. J. Wright, E. C. Jenkins, E. Dyke, J. H. Vigar, G. Jericho; Parilla—C. Foale; Arden Vale and Wyacca—D. W. Stokes; Yadnarie—A. J. Hutchinson, H. Bauers; Nantawarra—J. H. Nicholls.

Life Membership.—The distinction of life membership was conferred upon the following gentlemen, viz.:—Messrs. Hugh Kennedy, Lyndoch; J. Watson, Mount Gambier; W. Head, Port Germein; E. S. Matthews, Angaston; R. Barr, jun., Pine Forest; W. Francis, Appila-Yarrowie; H. Hart, Millicent; A. Wilson, Tatiara; W. R. Whittaker, Port Broughton; F. Lehmann and J. Stanton, Hartley.

POULTRY NOTES.

By D. F. Laurie, Government Poultry Expert and Lecturer.

CURRENT TOPICS.

During September there was much activity among poultry breeders. The bulk of chickens required by the breeders, except perhaps those intended for the laying competition, are hatched during September or October. Numerous reports are to hand, and the general results of hatching and rearing so far seem to be satisfactory. The day-old chicken trade is becoming an important branch of poultry-breeding. Many people have neither time for nor inclination to use incubators, and broody hens are becoming yearly scarcer. In some parts of the world—apart from Egypt—there are co-operative hatcheries. In Australia and New Zealand, as elsewhere, the rule is that various breeders—noted and otherwise—sell day-old chickens, the progeny of their own stock. A few people buy eggs from other breeders, some buy shop eggs. One breeder last season sold close upon 5,000 day-old chickens, and there are numerous breeders who sold varying numbers. This development in the industry must make for great expansion, and, as a rule, improvement. The quality is governed somewhat by the prices charged. Many breeders sell only those chickens which are bred from reliable stock. It is hoped that few, if any, will sell chickens bred from pullets or from inferior stock.

At the Show.

The Royal Agricultural Show is always an event among breeders, and it was pleasing to note the large attendance of fanciers, and also to note the keen interest displayed by the public generally. Space does not permit of a lengthy discussion of the various sections, but among the notable ones I have great hopes of are the three all-round white breeds, viz., White Orpingtons, White Wyandottes, and White Plymouth Rocks.

The White Orpingtons are becoming very popular, and are highly spoken of by the various breeders. The White Wyandotte has always been a favorite of mine, and if bred on proper lines will become an ideal farm fowl. The White Rocks are forging ahead, and time will show their value or otherwise. The absence of feather markings on these three breeds allows more attention being paid to type, size, and egg production. Another breed which made an attractive display was the Rhode Island Red. This breed is very popular in England, and is said to be very hardy and the hens good layers of standard-sized eggs.

In regard to show Leghorns the type of the winners was much more in accord with the true type of the breed. It was also a treat to see such a fine display of turkeys. Turkey-breeding is well worthy of more general attention.

THE DEPARTMENT EXHIBIT.

The departmental exhibit at the show this year differed in some respects from former exhibits. The usual display of poultry foods with explanatory cards was staged, and also many thousands of eggs, showing proper methods of packing and grading. These object lessons may be familiar to show visitors, but there is room among our producers for improvement which may be learned from these exhibits.

Foods.—The average poultry breeder pays scant attention to the value of variety of grain and other foods, nor is he yet alive to the vital importance of unlimited green food of the proper kinds.

The progress of the industry was shown in numerous large photographs of large poultry plants recently erected in the State. These represented only a few of the principal ones designed by the Poultry Expert for various breeders. Those displayed referred to the poultry plants of Messrs. Pope Bros. & Co. and J. Claridge, of Hectorville ; C. J. Chandler, of Sargenfri, East Payneham ; and F. H. Heinrich, of Freeling. I had a chat with Mr. von Rieben, who has recently erected a fine modern plant on a very large scale at Plympton. This I hope to visit before long.

Models.—Models of brooder-house brooders, chicken house and yard, scratching sheds, and farmers' poultry yards attracted so much attention that many people had difficulty in seeing them. This method of instruction evidently meets public approval, and will be extended at future shows. It is intended later on to issue a bulletin describing the various styles of housing and yarding under modern conditions. A number of applications for plans and particulars have been received.

GENERAL PURPOSE POULTRY CLUB.

The newly-formed General Purpose Poultry Club requested my help in the form of a lecture illustrated by fine lantern views depicting the various breeds and varieties to promote which the club has been formed. Thursday night of the show week is a time when most visitors to the show have had enough hard work, and there are various counter attractions ; still, about 160 people attended, and, after hearing the objects of the General Purpose Poultry Club, the numerous breeds were explained and fine slides screened. Mr. A. O. Thomas, of Hindmarsh Square, provided a fine electric lantern, which gave good definitions. He also procured for me a remarkable film shown by a bioscope and depicting the early stages of incubation; it was a wonderfully clear lesson in embryology. The actual process of hatching out and drying were also well shown. This film will be available on future occasions.

VISIT TO PARAFIELD.

During the show week numerous visitors from the country who had to leave the city before Saturday were given permits to inspect the poultry station. On the Saturday morning about 70 ladies and gentlemen journeyed by train and a score or so more went by motor car, trap, &c., to the poultry station. There the works in progress were inspected and the general scheme fully explained. A fusilade of questions on all poultry subjects continued throughout the visit. The laying competition—906 fowls—attracted great attention. The birds were released from their houses that morning for the first time since April 1st. Some, who were much against the idea of confinement, looked surprised when they saw that numbers of the birds had returned to their comfortable houses and were busily scratching. The incubation house, in which all the machines are heated by air gas; the two big brooder houses, each 100ft. long, also gas-heated, were inspected. In the brooder houses there were about 2,000 chickens and in the chicken runs some distance away there were 1,000 odd chickens in all stages of growth. The breeding stock, feed houses, workshop, &c., were all points of interest. Doubtless each year at show time there will be similar gatherings at Parafield, and each year it is hoped good seed (of an educational nature) will be sown among the visitors.

OPERATIONS FOR OCTOBER.

As previously pointed out, all chickens should be hatched not later than October. In a few favored localities, like Mount Barker, the later hatched chickens thrive and grow well, but in the north and in the State generally November and December chickens are not worth rearing. This matter was definitely proved in a series of experiments during several years at the former poultry stations.

Green Food.—The State has been blessed by a most splendid downfall of rain, and it is to be hoped all breeders are planting vigorously for summer and autumn use. Lucerne is, of course, the great fodder for the poultry breeder, but he will also find that sorghum and maize will give a wonderful supply of a fodder much appreciated by poultry. Breeders can hardly give too much green food. The birds can have practically as much as they will eat, and it should be fresh cut and succulent.

Brooders.—Do not overheat the brooders. It is a common mistake. Very little added heat is required, as long as the brooder is cosy and well ventilated.

Vermin.—Look out daily for vermin. Parasites such as ticks, red mites, and lice are responsible for half the losses among poultry. They are as a rule disease carriers. The articles appearing in the *Journal* have been prepared by me with a great amount of hard work to bring before the breeders the importance of this question, and also to illustrate the various sorts of vermin and to explain their habits, &c.

The Chickens must be kept growing without a check. Move them from yard to yard, or, if on free range, move the coops to a different locality. Separate the cockerels from the pullets as soon as the sexes can be distinguished; both thrive the better for this. Give variety in food, and do not overlook the great value of hulled or shelled oats and plenty of green food.

Ducklings for market must be pushed along right from the shell, a check will mean practical loss of profit. Feed liberally, using plenty of green food and also animal food daily; this is essential to success. Keep the ducklings dry and shaded from the hot sun, and see that drinking water is available day and night.

Turkeys.—Most farmers make the mistake of selling their old stock. Turkey hens are not fit to breed from until they are two years old, and it is better to have the gobblers the same age. Breeding from yearling hens is the cause of much of the degeneration which has taken place; this and want of selection.

Eggs.—Collect the eggs daily, and as the weather gets warmer collect twice a day. Provide nests in a cool spot and store the eggs in a cellar. If you have no cellar, one suitable for eggs can soon and cheaply be excavated and made.

Infertile Eggs.—Let me continue to impress the superiority of the infertile egg for market. Dispose of all surplus cockerels and pen the others away from the hens and pullets. Eggs which are fertilised are of little value from a commercial point of view. It is time our South Australian poultry breeders left off selling eggs of doubtful quality. That is the work of a fool or a rogue, surely. If you knowingly sell bad eggs you are scarcely honest. If you do not know by now that a fertile egg soon goes bad you must be foolish. This point has been urged by me for 20 years or more.

Pack properly.—Do not pack dirty-shelled eggs, wash them and dry with a clean cloth. Use sweet chaff and sound boxes. You can buy proper egg cases fitted with fillers and wood wool pads; these minimise breakages and no chaff is required. Bad packing is responsible for great losses, and the only man who bears the loss is the producer. We shall never see the trade as it should be until the system of barter is abolished. The egg trade is one that requires special knowledge, and this the average storekeeper does not possess; at all events he rarely packs his eggs properly.

TABLE BIRDS.

There is a good demand in Adelaide for prime chickens. Fatten the chickens properly before forwarding to market. In a very short time buyers will be operating to fill the Christmas market orders. Have your birds ready early in December. Buyers must have their stocks dressed and packed in the cool rooms before the Christmas market begins. Prices fall and competition eases just about Christmas. Liberal feeding is necessary. Use bran and pollard, or if you have a crusher, use oats and barley and a little maize. Feed on a variety of food and keep the birds quiet and undisturbed. Ducklings are very timid, especially at night. If subjected to nightly disturbance they will lose weight and may even be injured during their frantic rushes. Do not use lime where ducks are. Many cases are on record where much damage has resulted; in some cases deaths have occurred.

Water.—Clean out and scald the drinking vessels. The water supply is often the medium for distributing diseases.

Diseases such as roup (diphtheria) cannot be cured. All sorts of nostrums are sold, and at the best they merely hold the disease in temporary check. In consequence there are periodical outbreaks. Destroy all diseased stock; it is the only sure method. Keep the houses clean and at intervals spray with a good disinfectant. You say it costs money. Just so. If there were no such drawbacks poultry-breeding would be the most profitable occupation on earth. The more skilfully a man houses and feeds good stock and keeps down disease the more money he makes. This is the key. Prevention is better than cure. When disease breaks out it is too late.

Ostrich Farm, Port Augusta.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, to terminate March 31st, 1914.]

SECTION I.—LIGHT BREEDS.

WHITE LEGHORNS.

Competitor.	Eggs Laid for Month ended Sept. 30th.	Total Eggs Laid from April 1st, 1913, to September 30th, 1913.
Hurford, E. W., Grangeville	121	624
Hammill, H., Kogarah, New South Wales	140	630
Carter, A. A., Keswick	129	429
Robins, G. W., Hawthorn, Victoria	135	638
Dunn, L. F., Keswick	130	579
McKenzie, H., Northcote, Victoria	141	684
Cowan Bros., Burwood, New South Wales	141	601
Robbins, G. W., Hawthorn, Victoria	117	552
Pettigrove, T. A., Northcote, Victoria	127	611
Eckermann, W. P., Eudunda	134	442
Robertson, F., New Hindmarsh	136	435
Pettigrove, T. A., Northcote, Victoria	138	659
Cant, E. V., Medindie	138	531
Schäfer, N. H., Strathalbyn	143	630
Redfern Poultry Farm, Caulfield, Victoria	136	574
Chapman, G. H., Port Pirie	92	381
Lewis, F. M., Caulfield, Victoria	136	505
Redfern Poultry Farm, Caulfield, Victoria	129	650
Hagel, W. C., Mallala	128	560
Hocking, E. D., Kadina	127	438
Sargenfri Poultry Yards, East Payneham	150	546
Joass, W. A., Rothbury, New South Wales	147	574
Bennett & Furze, Wright Street, Adelaide	129	559
Jury, W. H., Torrensville	119	573
Olive Poultry Farm, Freeling	136	554
Kelly, Mrs. W. J. L., Quorn	108	307
Indra Poultry Farm, Freeling	155	733
Electricum Poultry Yards, Glenelg	119	557
Sargenfri Poultry Yards, East Payneham	147	643
Moritz Bros., Kalangadoo	139	146
Brown, S., Gembrook South, Victoria	136	638
Matthews, H. G., Fullerton	143	609
Harris, J. G., Black Forest	132	619
Tockington Park Poultry Farm, Grange	144	673
Bradley, J. E., Newport, Victoria	129	697
Miller, B., Parkside	126	468
McKenzie, E., Northcote, Victoria	148	733
Tockington Park Poultry Farm, Grange	138	625
Provis, W., & Son, Tumby Bay	144	612
Hillcrest Poultry Farm, Brighton, Victoria	123	622

EGG-LAYING COMPETITION—*Continued.*

SECTION I.—LIGHT BREEDS—*Continued.*

WHITE LEGHORNS—*Continued.*

Competitor.	Eggs Laid for Month ended Sept. 30th.	Total Eggs Laid from April 1st, 1913, to September 30th, 1913.
Beadnall Bros., Gawler	128	462
Morgan & Watson, Frankston, Victoria	151	715
Gibbs & Pine, Queenstown	122	384
Hillside Poultry Yards, Hamley Bridge	117	458
Hall, A. W., South Oakleigh, Victoria	141	535
Dreyer, G. H., Wolfram Street, Broken Hill	148	626
South Yan Yean Poultry Farm, Doreen, Victoria	142	568
Pope, R. W., Heidelberg, Victoria	151	696
Tabuteau, J. O., Black Rock, Melbourne	109	552
"Koonoowarra," Enfield	125	502
Hagger, J. C., Orroroo	130	597
Bertelsmeier, C. B., Clare	148	577
South Yan Yean Poultry Farm, Doreen, Victoria	140	567
Jelliff, Mrs. T., Beverley, Adelaide	123	621
Hughes, J. J., Elsternwick, Victoria	140	486
Stewart, J. R., Thirlmere, New South Wales	128	492
Aveling, T. B., Quorn	125	382
"Nunkerowi," Neales Flat	123	339
Prior, D., Moonta Mines	128	467
Leonard, W. J., Port Pirie	136	480
Barkla, L. W., Gawler South	112	474
Foreman, E., Hindmarsh	133	483
Broderick Bros., Gawler	122	418
Tubb, E. C., Frewville	123	431
Harfield, B. L., Pinnaroo	125	434
Foreman, E., Hindmarsh	142	478
Tomlinson, W., Westbourne Park	136	556
Woodhead, H., Torrensville	129	606
Padman, A. H., Hyde Park	145	567
Franklin, G., Norwood	156	657
Mathias & Weller, Unley	136	442
Messenger, A., Port Adelaide	144	583
Albion Poultry Farm, Magill	115	590
Dunstan, L. A., Port Pirie	131	477
Trenwith, T. H., Kadina	141	413
Purvis, W., Glanville	148	599
Rice, J. E., Cottonville	126	543
Evans, H. A., Richmond	122	475
Miels, C. & H., Littlehampton	118	566
Swift, W. G., Northcote, Victoria	141	622
Bertelsmeier, C. B., Clare	142	617
Brundrett, S., Moonee Ponds	142	492
Glenelg River Poultry Farm, Mount Gambier	136	554
Padman, A. H., Hyde Park	144	513
Purvis, Miss Gracie, Glanville	129	497
Braund, J. E. & H. J., Islington	119	484
Ontario Poultry Farm, Clarendon	123	402
Brock, A. G., Hamley Bridge	140	420
Russell, E. L., Salisbury	142	516
Schwabl, J., Elsternwick, Victoria	136	548
Moritz Bros, Kalangadoo	143	596

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended Sept. 30th.	Total Eggs Laid from April 1st, 1913, to September 30th, 1913.
SECTION I.—LIGHT BREEDS—*Continued.*		
White Leghorns—*Continued.*		
Craig Bros., Hackney	131	485
Codling, H., Mitcham Park	98	390
Tidswell, H. J., Clarence Park	115	366
Bennett, E. V., Kalangadoo	132	533
Lillywhite, R. G., Malvern	118	444
Harris, A. W., Mallala	136	551
Hagger, W. H., Malvern	113	623
Winter, W. C., (Nalpa), Strathalbyn	103	371
Whitegate Poultry Farm, Deepdene, Victoria	140	483
Brown Leghorn.		
Toe, C. E., Brighton, Victoria	97	220
Black Minorca.		
Whitrow, A. J., Knoxville	114	423
SECTION II.—HEAVY BREEDS.		
Black Orpingtons.		
Neville, A. B., Fullarton	131	507
Thornton, W. J., Kew, Victoria	110	480
Kenway, D., West Pennant Hills, New South Wales	136	669
Martin, B. P., Unley Park	132	555
Cowan Bros., Burwood, New South Wales	123	519
Tockington Park Poultry Farm, Grange	121	442
Pearson, W. S., Kingswood	132	436
Hall, A W., South Oakleigh, Victoria	123	463
Padman, J. E., Plympton	130	489
Greaves, W. E., Prospect	99	281
Bertelsmeier, C. B., Clare	70	262
Coto, T. W., Myrtle Bank, Victoria	124	543
Convent of the Good Shepherd, Oakleigh, Victoria	103	401
Buff Orpingtons.		
Hocart, F. W., Clarence Park	77	393
Silver Wyandottes.		
Dunn, L. F., Keswick	115	544
Western, F. C., Marion	84	355
Kappler Bros , Marion	99	401
White Wyandottes.		
Bradley, J. E., Newport, Victoria	111	495
Black Langshans.		
Stevens, E. F., Littlehampton	113	443
Faverolles.		
Williams, W. H , Frewville	113	292
Dorkings.		
Cathcart, J. F., Newburg, Scotland	122	311

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended Sept. 30th.	Total Eggs Laid from April 1st, 1913, to September 30th, 1913.
SECTION III.—PRODUCERS.		
Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.		
WHITE LEGHORNS.		
Broster, G., Mallala	134	563
Carling, R., Kangaroo Flat	128	605
Rowe, J., Long Plain	120	527
Broster, G., Mallala	142	566
Gilbert, F. W., Kangaroo Flat	148	630
Campbell J. D., Barabba	146	580
Forest Leigh Poultry Farm, Jamestown	141	483
Kerr, R., Longwood	133	564
Carling, Mrs., R., Kangaroo Flat	140	609
Rowe, J., Long Plains	132	536
Gill, R., Marrabel	140	465
Wurst, G. H., Marrabel	146	502
Sherrah, E., Long Plain	123	487
Rowe, N., Long Plain	133	544
Shepherd, R. H., Balaklava	143	485
Lacey, F. C., Kybybolite	139	584
Bertelsmeier, O. O., Booborowie	132	547
Dunn, H. J., Black Springs	130	422
Drake, C., Naracoorte	111	453
Rackham, C. Naracoorte	141	619
Holmes, F. A., Naracoorte	111	463
Hutchison, W. J. S., Naracoorte	100	359
"Herdsfield," Mount Gambier	148	663
Smith, R. L., Hynam	111	397
Gill, Mrs. J., Kapunda	128	419
Sampson, C., Kooringa, Burra	154	597
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	113	343
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	109	487

D. F. LAURIE, Poultry Expert.

PARAFIELD EGG-LAYING COMPETITION.

MONTHLY REPORT.

HEALTH.

The birds are in good health and their general appearance is very satisfactory. One pen, however, are all confirmed feather-eaters. On arrival at the competition, on March 31st, the wings of these birds appeared as if picked in parts, and no feathers grew subsequently. The denuded areas have increased, and some brown feathers also appeared. Various remedies have been tried, including a liberal application of aloes ointment. These birds are unsightly.

DEATHS.

Eight deaths occurred, viz., five cannibalism, two found dead, one waster. Owing to cannibalism one pen ceased to compete, as the owner could not forward the necessary replacements. This trouble must be stamped out by breeders—such stock is worthless.

BROODINESS.

During the month the following hens became broody :—Nineteen Black Orpingtons, 4 Buff Orpingtons, 4 Silver Wyandottes, 3 White Wyandottes, 4 Langshans, 2 Dorkings, 3 White Leghorns ; total 39.

EGG PRODUCTION.

The yield continues satisfactorily, and the general averages are well maintained. The 906 birds laid 19,469 eggs ; average per pen 21·48 eggs. *Comparison of Pen Averages*, 1911-12, 1912-13. — 1911-12—134 pens. 473·6 per pen to September 30th. 1912-13—151 pens, 519·0 per pen to September 30th. This shows an increase per pen of 45·6 eggs. The birds were confined in their pens from April 1st until Saturday, September 13th, when the yards were completed and the birds released on the occasion of the first annual visit of farmers and others. The appearance of the birds when released was excellent. A large number of the birds only remained in the yards a few minutes, and then returned to their houses. They were not particularly anxious for liberty.

VISITORS.

One hundred and fifty visitors inspected the Poultry Station during the month. Many of the visitors came for the purpose of noting the construction of houses, &c., and to gain other information. The convenient situation of this Poultry Station will considerably extend its educational value as an experiment and demonstration station.

WEATHER.

Moderate conditions prevailed during the month. The total rain precipitation amounted to 2·60 inches, which was very beneficial to the various growing fodder crops, all of which are looking well, and promising ample provision of green food in future.

D. F. LAURIE, Poultry Expert and Lecturer.

GET RID OF THE FLY.

A DEADLY PERIL.

It is only within recent years that the treachery of flies has been completely proved; hence the ignorance of the general public on this point is not surprising. But now, writes *The American Agriculturist*, that we know that flies do carry these diseases from place to place, it behoves us to fight them as we would a deadly serpent. Recent experiments of the Bussey Institute, the Harvard Medical School, and the Massachusetts State Board of Health have shown conclusively that flies, particularly the stable fly, is the carrier of the much-dreaded virus of infantile paralysis. Some time ago Professor Theobald Smith showed that Texas fever of cattle is transmitted through ticks, and the Government is spending thousands of dollars to meet the difficulty. Following directly on that discovery came the enlightenment that the virus of malaria and yellow fever are transmitted by certain insects, and that of the sleeping sickness of Africa by the tsetse fly. As a result of this work Uncle Sam cleared first Cuba and then the canal zone of the epidemics of yellow fever and the scourge of malaria, which hitherto made living so dangerous for white men in the tropics.

In the infantile paralysis experiments Professor Rosenau and his associates of the Harvard Medical School first infected monkeys with the paralysis germs. They were then allowed to be bitten by the stable fly. After a necessary interval these flies were allowed to bite other monkeys, with the result that the animals exhibited all the symptoms of the disease in six cases out of 12, establishing the fact that the disease can be carried by these insects. The experiment was repeated and confirmed by Drs. Anderson and Frost, of the public health and marine hospital service at Washington; hence the proof is complete that flies carry the virus which has kept the medical profession guessing and parents in constant fear in recent years.

The bacilli of tuberculosis are easily disseminated by the fly, because it feeds on sputum, and because the tubercle bacilli may pass alive through the digestive tract and appear in fly excreta, commonly known as fly specks. Dr. Lord found these germs alive in the excreta of flies fed with sputum 15 days after they had been passed.

Who, either at home or in some public restaurant, has not been compelled to fight for his food with the myriads of house flies that swarm about? The wonder is where they all came from. Investigation would probably show one or more of three causes operating—One, neglected garbage; two, some stable with accumulating manure ; or three, a dump near by. At the seashore other species of fly than the house fly find the dead fish thrown on shore an excellent breeding-ground.

To thoroughly grasp the best means of fighting them, it is well to recall their repulsive life cycle. Flies lay their eggs upon horse or cow dung, decaying vegetables, meat, cheese, dead animals, and human excreta. The larvæ emerge from the egg and feed on the mass on which they were deposited. After a variable number of days they shut themselves into their skin, which forms a hard case around them, and in it they are known as pupæ. There they undergo the marvellous transformation into the winged insect.

Characteristics of Stable Fly.

The stable fly, which is especially dangerous to human beings, is much like the ordinary house fly, to which it is closely related, and for which it is frequently mistaken on account of size, somewhat similar coloration, and common occurrence near human habitations. However, the Harvard alumni bulletin points out that they differ in some respects of habit, structure, and distribution.

The adult stable fly feeds exclusively on blood, biting various animals, and less commonly human beings. Naturally, they are more common in the country, where there are more animals, although it is difficult to find any place of any size where, under ordinary conditions, the fly does not occur. The stable fly does not enter houses so commonly as the ordinary house fly, but is inclined to remain in the open and sunny places, except when attracted elsewhere to feed. It appears early in the spring, and becomes more abundant in midsummer, and stays later in the fall than the house fly. Its breeding-places are much the same as with the house fly.

How to Fight the Peril.

The great question is how to control the fly peril. The campaign must be one for general cleanliness and neatness, as well as a campaign against a troublesome pest. Ordinary fly traps and sticky fly paper are used to good advantage with the house fly, but are practically useless with the stable fly. For the latter, the most important control measure now known is to attack its breeding-places. Any methods which will do away with or exclude manure piles, decaying plant or animal life, from flies is to be recommended. Direct removal in the summer of all animal waste is important to the farmer, not only for the safety of his family, but because it is a good principle of agriculture.

Extreme care should be exercised in the protection of closets. In this day of improved hydraulic rams, gas engines, &c., bathrooms are within the reach of many farmers who thought them a luxury half a dozen years ago.

A thorough campaign of education should be followed. Let the schools, the women's clubs, the bureaus, and civic organizations take the lead. Spread abroad the facts that flies are deadly enemies of mankind, and encourage all possible means of reducing their number. Encourage local boards of health to assert their powers and duties in the matter; co-operate with the State Board of Health. See to it that all foodstuffs are properly screened, and teach the importance of absolute cleanliness at the barn as well as in the house. Eternal vigilance is the price of freedom from filth and flies.

Public-spirited individuals, the council or other progressive body, may well institute fly-swatting contests. Encourage children, and grown-ups as well, to kill off these traitors by the thousands. It is surprising what a little well-organised effort will accomplish in this connection. One can do much alone, but this is a campaign which is both a public nuisance and a public menace. Watch out for your own premises, and if your neighbors are inclined to be negligent, study means of bringing them into line.

Killing by Means of Poison.

Millions of flies can be poisoned, and Professor R. P. Smith, of North Carolina, makes a good suggestion in this connection. He says, "Formalin is a very successful poison for flies. I have used it extensively with excellent results. I take two tablespoons of formalin to one pint of equal parts milk and water. In this proportion the mixture seems to attract the flies much better than when using sweetened water. Expose the mixture in shallow plates. A piece of bread in the middle of the plate furnishes more space for the flies to alight and serves to attract a greater number of them. I first used this poison in a milk room, where the flies were very abundent, and killed over 5,000 of them in less than 24 hours. Another experiment was tried in a large calf barn, where flies were numerous. I exposed six ordinary-sized plates of the formalin mixture, and killed 40,000 (four quarts) flies between 12 o'clock noon and 8 o'clock the next morning. I could cite many cases where the formalin mixture has been used in unscreened kitchens and dining-rooms, and resulted in killing practically all the flies. A good place to use it is on the front and back piazzas, where flies are frequently numerous and waiting to enter whenever the doors are opened."

THE AGRICULTURAL BUREAU.

TWENTY-FIFTH ANNUAL CONGRESS.

SILVER JUBILEE CELEBRATION.

The Twenty-fifth Annual Congress of the Agricultural Bureau was inaugurated on the evening of Monday, September 8th, by a banquet in the Brookman Hall, School of Mines and Industries, held to commemorate the 25th anniversary of the foundation of the organisation.

The function was attended by about 320 members of the Bureau, representing practically every district in the State, and a number of other prominent citizens. The Chairman of the Advisory Board of Agriculture (Mr. G. R. Laffer) presided, and he was supported by His Excellency the Governor, the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), Colonel Rowell, Professor Perkins (Principal of Roseworthy College), Messrs. A. M. Dawkins, J. Miller, C. E. Birks, C. J. Valentine, G. Jeffrey, W. G. Auld, C. J. Tuckwell, and T. H. Williams (members of the Advisory Board), the Commissioner of Public Works (Sir Richard Butler), the Victorian Director of Agriculture (Dr. Cameron), Professor Osborn (Professor of Botany and Vegetable Pathology), the Government Geologist (Mr. L. Keith Ward, B.A., B.E.), the Registrar of the School of Mines and Industries (Mr. L. Laybourne Smith). Colonel Castine, and officers of the Agricultural Department.

The toast of " The King " having been honored, the Chairman read several apologies received for non-attendance, including one from the Director of Agriculture (Mr. Wm. Lowrie, M.A., B.Sc.), who was absent through ill health.

THE GOVERNOR.

The Chairman gave " His Excellency the Governor," whose presence at that celebration of the 25th anniversary of the foundation of the Agricultural Bureau they regarded as an honor, and appreciated fully. During the time His Excellency had been in the State as representative of His Majesty he had embraced every opportunity of travelling about the State and making personal acquaintance with its resources and possibilities. (Applause.) Probably there was no other gentleman present who could more quickly sum up the possibilities of their land than His Excellency, who had come into contact with large numbers of people of all classes, and had not taken greater interest in any of them than in the men on the land. Particularly was that so in regard to those who had gone towards the outskirts of civilisation to subdue the wilderness and place it under cultivation. His Excellency realised that those pioneers were not only benefiting themselves and the State, but were helping to solve one of the greatest problems of Australia the peopling of the unoccupied areas of the Commonwealth. They all realised that if Australia was to become great and prosperous the first essential was not building towns and cities, but the development of the natural resources. It was not by living in congested cities that progress was helped, but by going out upon the land and developing its resources in agriculture, horticulture, and viticulture. Not only had His Excellency moved among the producers at their shows and other places, but had delivered speeches which it had been a pleasure to hear and read, and a prominent feature of which had been their Imperialistic tone. They realised with regret that that would be the last time His Excellency would attend a similar gathering, and he (the speaker) was certain that among his pleasant recollections of South Australia would be the sincere well wishes of the producers. (Applause.)

HIS EXCELLENCY'S REPLY.

His Excellency thanked the Chairman sincerely for the kind words with which he had proposed the toast and those present for their cordial reception of it. He heartily congratulated the Bureau upon the attainment of its silver jubilee, which they were commemorating that night. The Agricultural Bureau might well be proud of the part it had played during the last 25 years in the agricultural history of South Australia; the Bureau was not only a splendid educational institution, it was also an admirable social movement, as well as a disciplinary organisation for the formulation of a common agricultural policy. (Applause.) He very highly appreciated the opportunity afforded him at that and kindred gatherings, not only of getting into touch and sympathy with the agriculturists and pastoralists of the State, but also of learning at first hand from those best qualified to inform him of their difficulties, their anxieties, and their requirements, as well as the development of their wellbeing, their comfort, and their success. The meeting together of the farmers from all parts of the State gave opportunities for comparison of the results of their labors, as well as for the interchange of friendly social intercourse between those who, for the greater part of the year, were widely separated, and was of immense benefit, not only to themselves, but also to the agricultural industries of the State. Addressing the Chamber of Manufactures recently, he had said that the purchasing power of the community was mainly based upon the success of the agriculturists and pastoralists in their production and export of primary commodities, and that both manufacturers and agriculturists should take warning from the barometer when the mercury steadily flowed to the top of the glass and persistently remained there. The annual value of wool, of wheat, and of wine, was in the first instance a measure of the wellbeing of the pastoralist, the agriculturist, and the vigneron. But it was far more than that. It was a kind of barometer which predicted the measure of prosperity or otherwise which was about to visit all the employers of labor in the State, and especially the railways, hotels, motor car builders, tramways, and, because it largely affected the State revenue, even the power of the Government itself to provide employment for those workmen who depend for their subsistence upon daily wages. A large proportion of Government expenditure was justly based upon construction of railways, by means of which the cultivation of wheat-bearing areas and closer settlement might be extended and connected with the seaports of South Australia and the markets of the world.

THE RAILWAYS AND PRIMARY INDUSTRIES.

The railways, under the able management of the Commissioner (Mr. Moncrieff), had nobly responded to the demands imposed upon them, and this year had not only paid off every penny of the interest owing on the large sums originally spent in construction and maintenance and accumulated during the bad years of drought, but had also produced a net revenue for the year of £828,691, leaving a surplus of £262,101 as a credit balance. The aggregation of this sum was largely the result of pastoral and agricultural prosperity, of the efficient transport over the railway lines, of the enormous amounts of stock and agricultural commodities which the farmers of South Australia had produced, and to the conveyance of minerals from Broken Hill to Port Pirie. They should recognise the fundamental economic fact that it was principally the primary productive industries which had enabled the railways to achieve their financial success, and had also added to the wealth, paid the wages, and maintained the high standard of comfort which now existed in South Australia. The year 1912, like its predecessor, was exceptionally dry, September and October having been distinctly unfavorable. The late sown crops, however, had been wonderfully revived by the exceptionally fine general rains which fell during November.

SOUND DEVELOPMENT.

Taking all the circumstances into consideration, the returns for 1912-13 showed a remarkable example of sound agricultural development, and when considered in relation to the flourishing condition of the secondary industries, the extension of public and commercial utilities, the creation of ports and harbors, the construction of railways, tramways, roads, and bridges, the erection of towns, hospitals and churches, schools and colleges, the record of South Australia during the comparatively short period of 76 years would be hard to excel. But the development of the country was continuing and proceeding by leaps and bounds; the achievements of the past would be more than equalled by those of the future. In order to supply the insistent demand for land new country had to be opened up. This was first found in Pinnaroo. The success of the venture was immediate and striking. In five years after the opening of the railway. 1,580,000bush. of wheat and 15,600 tons of hay had been reaped from 145,000 acres, and that on soil previously thought unfit for cereal cropping. Fruit to the value of £130,000 was being annually returned from 5,000 acres at Renmark on the River Murray, and *The Lancet* had declared that the finest oranges which ever came to England came from there. (Applause). Railways aggregating 500 miles, and designed to serve approximately 8,000,000 acres, were being constructed on Eyre Peninsula and south-east of the Murray in the Brown's Well district. It was safe to predict that the 8,000,000 acres to be served by new railways would be ultimately taken up and successfully farmed. A continuance of prosperity and expansion for South Australian agricultural industries was therefore practically assured.

THE IMMEDIATE OUTLOOK.

The experience of South Australia in the past had been marked by the recurrence of dry seasons, during which the farmers had suffered severely by the loss of their live stock and the diminution of their crops. Although they still hoped for the best, there were signs that the present year might bring a drought of exceptional severity, which must heavily weigh upon the resources and endurance of the farmer, and through him exercise a far-reaching effect, not only upon every industry and upon every trade and business, but also upon every branch of the public service which depended for its upkeep upon the revenue of the State.

There were, however, certain gleams of sunshine to lighten the gloom of the apparently impending ill-fortune. In the first place the country was in a far more prosperous condition and better prepared to encounter difficulties than ever before. The wheat-bearing areas of new country on Eyre Peninsula and the Brown's Well and Pinnaroo districts, which he had already alluded to, appeared to be less affected by the dry conditions of the present season than the plains of Adelaide, and it seemed probable that those more distant areas, as well as the West Coast and Yorke Peninsula, would exercise a markedly favorable influence on the total amount of grain to be reaped during the harvest of 1913. The reticulation of the great reservoirs at Beetaloo, Bundaleer, and Barossa, the prosperous condition of the people, evidenced by the flourishing state of the Savings Banks and of the Mutual Provident Society of Australia, which was believed to be doing the largest insurance business in the world, together with the results of the harvests during the last 10 prosperous years were all advantages which this generation had received from its fathers, and which had cast upon it a heavy responsibility. This generation, having certain advantages handed down to it, might yet find itself in the position occupied in bygone days by their fathers, the pioneers, a position which might again require the exercise of the qualities of fortitude and endurance. In such a case who could doubt our farmers would show the same magnanimous spirit in self-sacrifice which their fathers, the pioneers, had before displayed when struggling through hardships and difficulties in order to achieve the prosperity and comfort which they had handed down to the present generation.

RECUPERATIVE AUSTRALIA.

There was, however, another and a brighter outlook—a silver lining to the cloud of gloom—which was to be found in the extraordinary revivifying properties of the Australian soil and climate. (Applause).

In 1828, after two years of drought, Sturt had found the Darling a navigable river, but as salt as the sea. Ten months afterwards, when one good season had intervened, Sturt returned to the Darling and had found a navigable river as before, but of purely fresh water. No matter how much flocks and herds might be reduced during an Australian drought; no matter how bare and scanty the harvest, the effect of one or two good seasons appeared to be always sufficient to restore the numbers of the live stock and to reinstate the fertility of the fields of grain.

Those considerations should ever be borne in mind and help to fortify their minds to bear present loss, in the hope of future prosperity, comfort, and happiness, if not for themselves then certainly for their children. They should remember how in recent years after every drought the advance had always been greater than before, and how much had been achieved in the past in spite of bad seasons, and how much they therefore might expect from the future. (Applause.) He thanked them again for their kind and cordial reception, and offered them his heartiest good wishes for the prosperity and success of the farmers of South Australia and their Agricultural Bureau. (Applause.)

THE MINISTER'S SPEECH.

The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) proposed "The Agricultural Bureau." He was pleased to see so great a gathering of agriculturists and members of the Bureau as were present that night. With all present he regretted that it would be the last time His Excellency would be among them. They had reached the high-water mark of the prosperity of the Bureau. (Applause.) He was proud of the work of the Bureau during the last 25 years. Its history had been one of continuous progress. In 1888 there were 10 Branches of the Bureau, nine of which were still existing. To-day it had 160 Branches and a membership of 3,500. In 1889 the average yield per acre under the old system, and before they had solved the problem of successful occupation of the land, was 7·9bush. on a rainfall of 25¼in. In 1912, with a rainfall of a little over 14in., it had increased to 10bush. 34lbs. (Cheers.) One of the factors in that result was the educational value of the Bureau system, and it was upon that phase of the work that he wished to speak that night. They had been learning during the past quarter of a century, and by learning had increased their strength and power.

ROSEWORTHY COLLEGE.

Among the factors which had helped them was the Roseworthy College. The achievements of that institution had been of value not only to this State, but to the whole of the Commonwealth. Some splendid men had passed through the college, and the other States had always been glad to get hold of them. That was a well-deserved compliment to the institution and to South Australia. They were glad to be able to supply the other States with men to administer their departments. Last year, it was noteworthy, the dux of the college had gained higher marks than had ever before been recorded. (Applause.) The students trained at Roseworthy on going out among the farmers had done much to revolutionise the agricultural industry and popularise the Agricultural Bureau system. Not only was the college educational from the standpoint of the students, but also from the experimental standpoint of the farmers. The experiments conducted included rotation of crops, manures for wheats, handling sheep on the Lower North farms, effects of heavy dressings of manures on the feeding value of the herbage, depth of ploughing, and the general treatment of bare fallow, the feeding value of hay cut during various stages of growth, including digestion tests, which he believed were the first of their kind in Australia. (Applause.) The college also dealt with forage crops, irrigation, and experiments, forest trees for domestic growth and fencing, and organic manures for the vineyard and orchard.

KYBYBOLITE.

One of the chief matters which Mr. Colebatch (the Superintendent of Agriculture in the South-East) had to deal with at the Kybybolite Experimental Farm was that of overcoming the surplus of water in the South-East. The subjects specially treated at Kybybolite were cheap and effective drainage, forage crops, grass and clover crops, light and heavy dressings of manure, and permanent experimental fallow plots, hand selection of cereals, and explosives and electricity for clearing. There were demonstration plots in six different parts of the South-East, and last year the Kybybolite Farm had had the most successful year since its establishment.

TURRETFIELD AND BOOBOROWIE.

At Turretfield, which was typical of the greater part of our safe country, they were doing the work they had formerly performed at Parafield. They were experimenting with the object of growing fodder for stock purposes without reducing the area under cultivation for wheat. It was hoped that the result would be that the farmers within the safe districts would be able to increase their wheat yields, and at the same time strengthen the lamb trade. They were also experimenting to ascertain how far horse traction could be superseded by other power. At Booborowie they were doing similar work, and making experiments in regard to manures. They had found that where they had supplied ¾cwt. of superphosphates per acre there had been a yield of 23·6bush. Where they had given 1cwt. there had been a return of 24·2bush. The cost of extra manure at 5s. a hundredweight had been 1s. 3d., and the profit from extra wheat at 3s. 4d. a bushel, deducting the cost of extra manure, had been 9d. an acre. Where 1½cwts. of manure had been used there had been a yield of 27·1bush., the cost of extra manure had been 1s. 9d., and the extra profit 7s. 11d. an acre. (Applause.) They could add to these results the increased fertility of the soil for grass and future crops. Thus they found that by increased manuring they could carry more stock on the land when not using it for crops, and the "blighting-off" theory was, in addition, exploded. Their tests at the same place with various quantities of seed wheat had shown that with Marshall's No. 3, when 40lbs. were sown to the acre the yield was 20·4bush., and where 55lbs. were used the yield was 22·5bush. an acre. The cost of extra seed at 4s. a bushel was 1s., and the value of the increased yield at 3s. 4d., after deducting the cost of extra seed, was 6s. an acre. Besides the recognised Government farms, they had agriculturists throughout the country who were conducting tests under Government supervision. Those were of great assistance to the department.

HORTICULTURE.

Then they had the Horticultural Expert (Mr. Quinn). It was generally recognised among the fruitgrowers that he was a man who knew his work. (Applause.) He was doing valuable service in investigating diseases peculiar to the orchards and finding remedies for them. Included in the work being carried on at the Government orchards was the testing of remedies for diseases, the effect of different manures, methods of pruning, which must, of course, go on for years to be of value, and the testing of different varieties of trees in regard to their ripening seasons and general superiority.

POULTRY.

Another valued officer was Mr. D. F. Laurie, the Poultry Expert, who for many years had fought an uphill fight. The new poultry station at Parafield was not quite complete yet, but arrangements were being made for a visit to it on Saturday next, and he was certain those who cared to make the trip would find it interesting and educational. Thousands of pounds were now being spent each year by private individuals, who had come to realise that poultry breeding was a profitable industry if properly looked after. The value of the poultry products was not less than £700,000 per annum, and the value of the exports to the other States amounted to £150,000 per annum. It augured well for the future of the industry that notwithstanding the increased production the average market value for eggs in 1912-13 showed an advance of 3d. per dozen over the average price for 1904.

DAIRYING.

Then they had the Dairy Expert (Mr. Suter), who had done a great deal to educate the people of this State in that branch of agriculture. South Australia, as they were aware, was not regarded as a dairying State. The farmers in the safe districts of the north found it better as a rule to grow wheat and raise other stock; but as the reclaimed areas on the Murray River came to occupation it was likely that more attention would be given to dairying. Mr. Suter had lectured with much success to school children, who were taught the first principles in the management of dairy stock.

Mr. Jackson, the Wool Expert, who belonged to the School of Mines, was also one of their most valued officers engaged in the education of the rural community. (Applause.)

THE VETERINARY LECTURER.

Recently the Government had appointed as Veterinary Lecturer Mr. Place, who had done much good work. (Applause.) Last year he attended 48 Branches of the Bureau, addressed 145 meetings, and he had travelled 16,000 miles in connection with his work. He had received many letters of thanks and appreciation from farmers and Bureaus respecting Mr. Place's lectures.

THE LAMB TRADE.

He regretted that the lamb export trade had fallen off owing to various influences, including unsatisfactory climatic conditions, during the last two or three years, and emphasized the bright prospects in various parts of the world for frozen meat. He strongly urged the farmers to give to this branch of the industry their closest attention. South Australia was being brought increasingly under the notice of the consumers in the old country, and in that respect Major Norton, the Trade Commissioner, was undoubtedly doing splendid work.

A WELL-ORGANISED DEPARTMENT.

They had probably read in the press that the Agricultural Department was in a state of chaos. If concentration meant chaos, the department was undoubtedly in that condition. If the leading officers working harmoniously together and with the Minister meant chaos, chaos certainly reigned. But he ventured to assert that never before in the history of the department had the officers worked so amicably together, and with the Ministerial head. (Applause.) He had visited many of the district conferences, and had found much pleasure in attending them. It did one good to witness the activity and intelligence displayed by the delegates, especially by the younger men All that showed that the agricultural industry must improve and increase under such conditions. (Applause.)

As a further means of disseminating knowledge, they had *The Journal of Agriculture*, which had a circulation of over 6,500, and contained much information useful to the producer. Coupled with that they must not forget the valuable help the Bureau had received from the two leading daily papers. Practically every agricultural conference in city or country was attended by the special representatives of *The Advertiser* and *The Register*. Two or three members of the Advisory Board always attended the district conferences, which were greatly appreciated. He had found South Australian farmers in every part of Australia except Tasmania, and he had always found them a success on the land. He supposed they were also working successfully in Tasmania.

BRIGHT HOPE FOR THE FUTURE.

He had told them of the activities of several of the branches of the department. The gratifying feature of it all was the existence of that grand institution, the Agricultural Bureau, with its effective organisation which enabled the officers of the department, after they had searched, tested, and proved, to come right into touch with the men on the land and give them what they had to impart. For 25 years that had been going on in some degree, and they had put to the practical test the suggestion of the scientist, and had proved that which was good. The result had been better farming, better and more produce, and greater prosperity to the producer and the State. Therefore, the bright hope for the future was that the Agricultural Bureau might still be the means of helping the men on the land to solve the problems and overcome the difficulties of their calling, rendering them less liable to serious inconvenience in odd seasons which may be unfavorable, and establishing them firmly as a most prosperous class. While they had an institution like the Agricultural Bureau, and a Director of Agriculture like Professor Lowrie, they need not fear for the future welfare of the primary industries of South Australia. (Applause.)

A VICTORIAN TRIBUTE.

Dr. Cameron (Victorian Director of Agriculture) said he was so sensible of the good work which had been done in years past by the South Australian Agricultural Bureau that he deemed it a very great honor indeed to be allowed to participate in the silver jubilee of the Bureau. He desired to thank Mr. Pascoe for having extended to him through the Victorian Minister of Agriculture the invitation to be present that night. No sooner had that invitation been received than his (the speaker's) Minister had directed that it be accepted. He had realised that the visit would undoubtedly prove of benefit to the farmers of Victoria. It was considered throughout the Commonwealth that the South Australian farmers were in the van so far as cereal growing was concerned. They were more successful in that department than any other State in the Commonwealth. Right from the time of the introduction of chemical fertilisers, the drill, fallowing, rotation of crops, and all the other advanced methods of agriculture, the other States had benefited from the pioneering work performed by the South Australian farmers. He believed, from what he had heard and read and from what he personally knew, that though the Agricultural Bureau had not perhaps actually conceived those advances, it had matured each and every one of them to the point of success and adoption in agricultural practices. And, once adopted by the farmers in South Australia, the farmers in other parts of the Commonwealth had quickly followed their lead. He was aware that the South Australian press appreciated the work of the Bureau, and gave the Agricultural Department all help possible. In that connection he desired to correct a slight typographical error. In one of the papers here it had been stated that the Agricultural Bureau of South Australia had become such a success that the other States were envious of it. He thought what was meant was emulous. (Applause.) He wanted them to understand that the feeling in the other States towards the Agricultural Bureau was not so much one of envy as of admiration. It was true that none of the other States had so far been successful in establishing an organisation on exactly the same lines as the South Australian Agricultural Bureau, but they had established kindred organisations. In Victoria, for instance, they had what was known as the Chamber of Agriculture, and the last farmers' convention held at Bairnsdale in connection with that body was attended by 460 farmers. He endorsed all that the Minister of Agriculture had said with regard to the excellence of the Roseworthy Agricultural College, and he wished publicly to acknowledge their indebtendess to South Australia for the reform of the stud horse industry, accomplished by Mr. Colebatch (the manager at Kybybolite), and to express his appreciation of the excellent services now being performed in Victoria by two old graduates in Mr. Richardson and Mr. Wilson. (Applause.) He deeply regretted the absence of Professor Lowrie, but hoped that the Director would soon be restored to good health. (Applause.)

Professor Perkins, in responding to the toast, mentioned that he had been directly associated with the Bureau for 21 years. His official position enabled him to claim first-hand knowledge of the immense value of the organisation as a system of arteries for conveying information of value to the farmers. It stood for all that was progressive in the practice of the rural industries.

Mr. A. M. Dawkins, representing the Northern Districts, also paid a tribute to the educational value of the Bureau.

Mr. E. M. Sage (West Coast District) thought there was no more useful institution in the State so far as the farmers were concerned.

Mr. J. C. Ruwoldt (South-Eastern Districts), who had been connected with the Bureau for 25 years, mentioned that the effect of the institution was an improvement in agricultural practices in the district.

Mr. P. J. Edwards (Eastern Districts) said that the Bureau was of immense value in a new district such as the Pinnaroo, especially as those taking up the land were generally unacquainted with the conditions.

LIFE MEMBERSHIP CERTIFICATES.

His Excellency the Governor then handed certificates of life membership to the following:—Angaston—S. O. Smith, F. Salter, A. Friend, E. S. Matthews; Appila-Yarrowie—W. Francis, J. C. W. Keller; Arden Vale-Wyacca—M. Eckert; Arthurton—T. B. Wicks; Balaklava—P. Anderson; Burra—J. H. Rogers; Carrieton—J. W. Bock; Cherry Gardens—G. Hicks; T. Jacobs, C. Ricks; Clare—J. H. Knappstein; Cradock—P. Gillick; Dawson—C. H. Meyers; Gawler River—T. B. Parker, R. Badcock, H. Roediger; Green Patch—E. M. Sage; Gumeracha—D. Hanna, J. Monfries; Hartley—J. Stanton; Hawker—A. C. Hirsch; Kanmantoo—W. G. Mills; Longwood—W. H. Hughes; Lyndoch—H. Kennedy; Millicent—H. Hart; Minlaton—S. Vanstone, J. McKenzie; Mount Gambier—J. Watson, J. C. Ruwoldt; Mount Pleasant—W. Lyddon; Narridy—H. Nicholls; Penola—H. Ricketts; Pine Forest—R. Barr, jun.; Port Broughton—G. E. Pattingale, W. R. Whittaker; Port Elliot—J. Brown, W. E. Hargreaves; Port Germein—W. Head; Port Pirie—E. J. Hector, T. Johns; Quorn—J. McColl; Renmark—W. H. Waters; Stockport—D. G. Stribling, J. Murray; Watervale—G. Hunter; Whyte-Yarcowie—Hon. T. Pascoe, M.L.C.; Wilmington—W. Slee, A. H. Noll, J. Schuppan, R. G. S. Payne; Wirrabara—P. Lawson; Woodside—C. W. Fowler, A. S. Hughes; Yongala Vale—A. Jamieson, sen.

THE BUSINESS MEETINGS.

Tuesday, September 9th.

MORNING SESSION.

The business sessions of the Congress were commenced at the School of Mines and Industries on Tuesday, September 9th, when Mr. G. R. Laffer (Chairman of the Advisory Board of Agriculture) presided.

During the sittings the following delegates attended:—Amyton—W. Gum; Angaston—F. Salter, S. O. Smith; Appila-Yarrowie—J. H. Bottrill, W. C. Francis; Arden Vale and Wyacca—J. A. Absalom; Arthurton—J. H. Colliver, W. R. Stephenson; Bandon—G. G. White, J. T. Colbert; Beetaloo Valley—J. L. Murphy, P. Curtin; Belalie North—T. Dunstone, D. Fox; Berri—W. F. Clayer, W. R. Lewis; Blackwood—A. W. Magarey; Blyth—A. L. McEwin, O. Eime; Booleroo Centre—W. Whibley, O. E. W. Bruns; Borrika—R. Collins, S. R. Haynes; Burra—J. H. Rogers, E. Finch; Bute—W. Sharman; Butler—G. Parker, R. W. Phillis; Canowie Belt—R. Carter, E. T. Daly;

Carrieton—J. W. Bock, G. Fuller; Clanfield—A. Correll, W. J. Booth Clare—J. H. Knappstein, J. Dux; Clarendon—A. Harper, sen., A. Phelps; Claypan Bore—F. S. Tall; Colton—E. H. Whitehead; Coomandook—W. Ninnis, C. M. Wilkin; Coomooroo—G. B. Lillicrapp, E. Berriman; Coonalpyn—E. E. Williams, A. J. R. Gurner, J. J. Cronin; Coonawarra—J. Skinner; Coorabie—N. M. Roberts; Cradock—M. Neylon; Crystal Brook—H. Billinghurst, B.A., M. P. Pavy; Davenport—J. Holdsworth, A. Bothwell; Dawson—J. Nottle, C. H. Meyers; Elbow Hill—W. T. Cooper; Forster—W. J. Sears, T. Searle; Frances—A. J. Baldock, J. McGillivary; Freeling—A. J. Kuhlmann; Friedrichswalde—F. W. Schutz, G. Grope; Gawler River—W. Rice, B. F. Hillier; Georgetown—M. J. McAuley, S. Eyre; Geranium—W. J. Mitchell, W. Pannell; Gladstone J. Sargent, T. Mutter, R. Lines; Glencoe—A. Dow, G. E. Copping; Goode—V. J. Tonkin; Green Patch—E. M. Sage; Gumeracha—D. Hanna, J. Monfries; Hartley—F. Lehmann, J. Stanton; Hawker—A. C. Hirsch; Ironbank—C. Morgan, R. Coates; Inman Valley—H. J. Dennis, J. W. Crompton; Julia—T. Prior, W. H. Neal; Kadina—J. Malcolm, R. Correll; Kalangadoo—D. W. Tucker, T. Bott; Kanmantoo—J. Downing, W. G. Mills; Keith J. MacIntyre, J. A. Lock; Koppio—W. Jericho, G. B. Gardner; Kybybolite -H. Lacey, C. A. Scholz; Lameroo—E. T. Wray, A. J. A. Koch; Leighton—T. Goodridge, W. Bailey; Longwood- J. R. Coles; Loxton—W. B. Russell; Lyndoch—H. Kennedy, A. Springbett; MacGillivray—A. Sands; Maitland—J. Hill; Mallala—A. E. Temby, J. Nairn; Mangalo—J. H. Cleave, J. W. Deer; Meadows—W. J. Stone, A. L. Ellis; Meningie—T. W. R. Hiscock, F. W. Newson; Millicent—H. F. L. Holzgrefe, H. Day; Monarto South—G. A. Hartmann, C. F. Altmann; Monteith—C. A. Bentley, A. Clark; Moonta—J. Atkinson, W. B. Stacey; Morchard- J. Scriven, W. Reichstein; Morgan—C. A. R. Wohling, J. Pope; Mount Barker—J. Pope; Mount Bryan—A. A. Jefferies; Mount Bryan East J. W. Best, R. Thomas; Mount Gambier—J. E. Watson, J. C. Ruwoldt; Mount Pleasant—H. A. Giles, W. Lyddon; Mount Remarkable—J. McIntosh, N. S. Giles; McNamara Bore—G. H. Perriam; Nantawarra—S. Sleep, R. D. Nicholls; Naracoorte—W. H. Smith, S. H. Schinckel; Narridy—J. Darley, P. Haren; Narrung—S. Bottrill, W. J. L. Thacker; North Booborowie—W. E. Hannaford, A. V. Simpson; Northfield—J. Williams; Orroroo—J. B. McDougall, J. C. Hagger; Parilla—H. G. Johnson, J. H. Dewhurst; Parilla Well—J. W. Johnston, E. H. Leak; Parrakie—F. J. Dayman, M. J. Cooney; Paskeville—J. P. Pontifex, T. H. Price; Penola—D. Adamson, H. Ricketts, sen.; Petina—O. J. Howard; Pine Forest—D. Carman, A. Hewett; Pinnaroo—P. J. Edwards, P. H. Jones; Port Broughton—G. E. Pattingale, W. R. Whittaker; Port Elliot—W. E. Hargreaves, J. Brown, W. Squires; Port Germein—J. Stewart, H. Crittenden; Port Pirie—J. Greig, A. M. Laurie; Quorn—R. Thompson, J. Brewster; Redhill—F. A. Wheaton; Renmark—W. H. Waters, H. S. Taylor; Riverton—J. P. Schultz, E. A. Gray; Roberts and Verran—R. Johnston, F. Masters; Saddleworth—W. Scales; Salisbury

—E. Moss, A. G. Jenkins; Spalding—E. E. Gill; Stockport—J. Murray, D. G. Stribling; Strathalbyn—J. W. C. Fischer, A. Beviss; Sutherlands—A. M. Twartz, jun.; Tarcowie—J. Burgess, A. Dempster; Tatiara—T. Stanton, T. L. Truman; Tintinarra—C. M. Ives, C. P. Hodge; Two Wells—W. S. Cordon, H. J. Wasley; Utera Plains—A. Venning, H. D. Rule; Waikerie—F. G. Rogers, J. C. Walters; Warcowie—G. Growden, J. Feineler; Watervale—G. Hunter, W. Smith; Wepowie—J. Crocker, M. M. Irvine; Whyte-Yarcowie—F. H. Lock, E. F. Pearce; Wilkawatt—W. J. Tylor, M. A. Neville; Willowie—B. E. Schmidt, W. P. Foulis; Willunga—J. A. Hughes, T. Pengilley; Wilmington—J. Schuppan; Wirrabara—J. Hollitt, A. R. Woodlands; Wirrega—H. H. Exton, L. J. Cook; Woodside—H. Rollbusch, R. P. Keddie; Wynarka—J. P. Beck, A. W. Laurie; Yabmana—H. P. McCallum; Yadnarie—H. Pearce; Yallunda—T. Forrest, J. W. Winch; Yongala Vale E. Cooper, A. Jamieson; Yorketown—W. Correll, C. Domaschenz.

MARKETING WHEAT.

Mr. S. Trengove (Bute Branch) read a paper on "The Marketing of Wheat" as follows:—

Improvement in the quality of South Australian wheat has for some time remained practically at a standstill, although much advance has been made in the quantity produced per acre. I believe that at one time South Australian wheat was looked upon as being the finest placed upon the world's markets, and, as a consequence, commanded the highest price. The highest price to-day is given for the hard Manitoban wheat; but our wheat is much sought after because of its value for mixing or blending. In fact, we are led to believe that most of our wheat is used for mixing purposes, and on that account we get a better price than that generally obtained by other wheats. We are credibly informed that during the last twenty years South Australia has not improved her wheat at the same rate as many other countries, and consequently it will only be a matter of time and we shall be left behind in the race. Let us see if we cannot find the reason of this apparent apathy among farmers which has led to the present unsatisfactory state of affairs.

A Premium on Carelessness.

The present system of buying wheat, while it has much to commend it, yet contains within itself the germ of all this trouble. Let us take, for example, two farmers delivering wheat to the same buyer. Both samples come up to the all-too-low standard. One sample, however, is well cleaned and of extra good quality and contains only 1 per cent. of dirt, while the other contains 6 per cent. of rubbish and small and inferior grains. Both farmers receive the same price for their wheat. The fact that the second farmer gets rid of 5 per cent. more rubbish than the first pleases him and encourages him in his careless habits. What encouragement does this offer to the first farmer who has brought in a good sample of wheat well cleaned. He realises that his neighbor, with a far inferior sample, has been paid as much per bushel as he. Here we have a type of farmer who, with a little encouragement, would soon improve the standard of wheat grown; who, knowing he has not received payment according to value, becomes careless also, and begins to think that as long as his wheat will pass the buyer that is all he need trouble about. Thus, buying in this way has a downward tendency on both farmers. From the above, it will be seen that the second farmer has delivered in 1,000 bags of wheat 60 bags of dirt and rubbish and inferior grains. Assuming the rubbish to be worth one-third of the value of wheat, and that wheat is worth 10s. per bag, there is £10 to be made up from somewhere. Wheat must be bought and sold on a law of averages. Therefore, we find that the first farmer is actually placing in the pocket of the second farmer a substantial cheque by allowing the poor wheat to be mixed with his good wheat. Accepting the view that wheat containing 1 per cent. dirt is clean wheat, an additional 5 per cent. represents, with wheat at 3s. 4d. per bushel, 2d. per bushel actual loss at the wheat stacks. Follow the wheat in and out of the stack, per train to the seaport, thence to London, extra handling, insurance, and cornsacks, and it is seen that this extra 5 per cent. of dirt has entailed enormous cost without any corresponding good results for the outlay; and all this might have been avoided by the farmer exercising more care.

In going around a district before reaping commences, it is often not a difficult matter to find crops containing 10 per cent., and even 20 per cent., of smut. This wheat when brought into the yard, although smelling very strongly of smut, is placed in the same stack as the good wheat. Against the practice of mixing poor wheat with good, and passing the whole as f.a.q., I raise my protest. If a farmer brings in wheat containing a lot of dirt or badly affected with smut, the agent ought to refuse to take it at top price.

ONE OF THE REASONS.

The merchant who allows his agent to buy wheat irrespective of the quality and condition of the same, and pays top price for all, is not the true friend of the farmer. But when we find, in a little country place producing only, say, 40,000 bags of wheat per year, and six or seven firms with three agents there, some of whom are buying on commission, one of the causes of poor wheat being bought at top price is explained. The agent has a living to make, and well knows that if he refuses to take a sample of wheat at top price every buyer in the yard will be tried until one is found to take it, when, not only does he lose that wheat, but no more will he get from that farmer for the season; and this is by no means an uncommon occurrence.

I have attempted in this paper to point out some of the things which have led to carelessness in placing wheat upon the market. That such carelessness does exist is beyond question. Several very large farmers, to my knowledge, say they never pickled a grain of wheat and yet always obtain top price for their wheat, smutty or not. If our farmers would all use a good seed grader and carefully clean their wheat from every foreign seed, pickle the wheat with a good solution of bluestone as a preventive of smut, and then, when harvesting, use a good open screen to allow as much rubbish as possible to pass into the screening box, a much better sample would be obtained. A higher standard could then be fixed, which would be a step in the right direction, because the world's buyers, seeing a high standard, would be more eager to buy. Not until farmers and merchants take a commomsense view of the matter and work together to place upon the world's market the best sample possible can we hope to have much improvement.

THE DISCUSSION.

Mr. G. B. Gardner (Koppio) considered the writer of the paper had raised an interesting question. The only way he (the speaker) could see of getting over the difficulty was that there should be two standards for wheat. Farmers were docked if their wheat was a trifle below the standard, and therefore they should be paid extra if the grain was above the standard. At present if their wheat went 5lbs. over the standard they would get no more than another man whose wheat only just reached the standard. That was an incentive for farmers not to clean their wheat.

Mr. W. B. Russell (Loxton) considered something should be done to encourage the man who took the trouble to get a good, clean sample. At present there was no inducement to do that, as so long as the wheat passed the standard that was all that was required. There were some farmers who said if their wheat passed the standard they might as well get paid for the dirt in it.

Mr. W. Gum (Amyton) said he had for a number of years advocated that the man who cleaned his wheat properly should get a higher price than the farmer who was careless, but whose wheat just came up to the standard. He had mentioned the matter to wheatbuyers, but they had always said that it would cause a good deal of dissatisfaction in the district if a man who brought in a good sample got a better price than the man who brought in a poor sample. He thought the dissatisfaction would be on the part of the man who brought in the poor sample, and he would soon find that it would pay him to clean his wheat properly. (Applause.) He had seen wheat brought to market with a tremendous amount of rubbish in it, although the grain was of good quality. If farmers made it their business to clean their wheat well they would find they would soon reap the benefit.

Mr. H. Smith (Naracoorte) congratulated the writer of the paper on having introduced the question, which had for a long time been a burning one. While the farmer was at the mercy of a few buyers who combined to fix the price of wheat he would never get the advantage he should for properly cleaning the wheat. What was the good of the farmer cleaning his wheat and bringing in a good sample when he did not get any recompense for the extra trouble he had been put to. Let them consider the difference as regards wool. Wool went into the open market and was bought according to its quality. It therefore paid the woolgrower to grade the wool. Until the farmers combined so that they might dictate to the wheatbuyer instead of the latter dictating to them, they would have to put up with the present state of affairs.

Mr. F. H. Lock (Whyte-Yarcowie) thought many farmers were glad to hear that the standard had been fixed on the low side, but it was absolutely to their disadvantage. One thing certain was that the merchants were "on a good wicket," and likely to remain there until the farmers woke up and demanded a fair deal. If a farmer cleaned his wheat well and brought to market a sample which went 2lbs. or 3lbs. above the average he got no more for his wheat, but if it happened to be ½lb. below the standard he was docked. The merchant bought wheat up to the standard, and also that over the standard, at the standard price, but for anything below the standard he paid less, so that every time he stood to win. The suggestion that there should be two standards had been made, but he did not think much benefit would result from that. In America and other places they did not go in for the standard business at all. The farmers graded their wheat and sold it on its merits. South Australia was one of the few wheat-growing countries that adhered to the bag system, and while they stuck to that there would not be much improvement. The bulk handling of wheat was a question which must be considered. The bulk-handling system had been proved in New South Wales and other places both economical and effective, and why should it not be adopted in South Australia? It was fairly certain that the wheat merchants would not help them to get that system introduced, and the farmers would have to make a move themselves. If they showed that bulk handling would mean a saving in money and labor, the Government would go into the question. He did not say the system could be worked economically in South Australia, but it was one which must be inquired into. The system of bulk handling was wonderfully economical as regards labor and in other ways, and the various Branches should certainly discuss the question, so that some idea of the cost of its introduction might be obtained.

Mr. E. F. Pearce (Whyte-Yarcowie) said the question of marketing wheat was one that had been exercising the minds of the farmers for a long time past. The competition amongst agents was so keen in his district that if an inferior sample was brought in there was no trouble in getting rid of it at the same price as that paid for the best sample offered. He knew that some farmers covered the screens of their harvesters because otherwise they took out too much of the rubbish. He did not say that that was creditable to the farmers, but from the point of view of pounds, shillings, and pence, those who adopted that practice undoubtedly reaped an advantage over the man who cleaned his wheat thoroughly but got no more for it. So far as he could see the adoption of bulk handling offered the most likely solution of the trouble. That system was the best for handling grain which had been devised, and as the railways belonged to the State, and the elevators should belong to the State, the farmers here would not, as a result of bulk handling, be like they were in America--crushed by the railway companies and elevator owners. It was not only a question of getting more for their wheat, it was also a question of saving the enormous loss occasioned year after year through damage to sacks, and other expenses such as agents' salaries, all of which came out of the pockets of the farmers.

Mr. D. W. Tucker (Kalangadoo) said it seemed to him that it would be wise to do away with the standard for wheat altogether ; then the wheat could be sold like wool, on quality, and the man who had the best wheat would get the best price. A lot had been said about the farmers being "got at" by the buyer, but from what they had heard about covering up screens, it appeared that the buyer was also being "got at" by the farmer.

Mr. A. J. Lock (Keith) said the question was one of great importance to farmers. Undoubtedly there was an understanding among the merchants, and it was time that the farmers combined. If wheat was below the standard the farmers were docked, but it all went to England as one standard.

Mr. F. Gasmier (Wilkawatt) urged the necessity of farmers uniting together. At present they had no say whatever in the price of wheat. They had simply to go to the buyer and ask what was being given. The farmers should unite and not sell to the merchants at all, and should not export 1bush. of wheat to England, but should send it all away in the shape of first-class flour. He agreed with the writer of the paper that wheat should be properly cleaned, so that the standard of South Australian wheat might be maintained.

Mr. W. R. Stephenson (Arthurton) took exception to the statement that there had been no improvement in the quality of South Australian wheat during recent years. In a climate like that of this State quality did not altogether depend on cultivation, but very largely on the quantity of moisture. There was a great deal to be said in favor of cleaning the wheat, but, as had been repeatedly pointed out, there was at present no advantage in doing so.

Mr. D. G. Stribling (Stockport) said a great deal had been said in regard to how badly the merchants were treating the farmers, but he did not think the farmers had much to complain about. He thought the merchants treated them very fairly. There was, perhaps, a time when it paid to put dirty wheat on the market, but now, with labor and land so dear, that time had gone by. The farmer from a sense of pride in his calling, if for no other reason, should grow clean wheat, and if he did so he would find he would be very fairly treated by the merchants. The farmers in South Australia to-day were getting as good a price for their wheat as many merchants were getting on the English market.

Mr. G. H. Periam (McNamara Bore) said that the man who started on mallee country had great trouble through the shoots, and found that no machine would clean the wheat properly unless it was put through a grader. Mallee farmers could not afford to go to that trouble. If wheat were marketed in bulk the farmers would have to produce a much better quality than when the grain was put in bags, because the bags hid a lot of impurities mixed with the wheat. He did not think there was much to complain about in regard to the wheatbuyers. The difference in the price given by the merchants here and the price the merchant received in England was very little. If wheat were marketed in bulk the farmers would have to bring in a first-class sample, and they would find they would be docked more than at present. How could they get the barley out? The wheat would have to be passed through special machinery to get the wild oats and barley out.

Mr. A. L. McEwin (Blyth) said there was no place in the world that had made so much improvement in the quality of its wheat as had South Australia. He believed the wheat merchants were men of high integrity. Something had been said about going to the wheat merchants and demanding a better price. Did they realise that the whole of the wheat grown in the Commonwealth would not supply the European market for more than two weeks? Under those circumstances how much control did they have over prices on the European wheat market? He believed they could market their wheat more cheaply by the elevator system, as bags were very expensive. He had paid £350 a year ago for bags alone. They had, however, to consider what position they would be placed in if they had the elevator system. It was a big question, and required a lot of consideration. He did not believe the statement that farmers deliberately allowed dirty wheat to go on the market. If they did they were bigger rogues than he had imagined. (Laughter.)

Mr. J. Brown (Port Elliot) said a farmer who got 10 per cent. or 20 per cent. of smut in his wheat was a dirty farmer. The first essential was to get good seed, and the next thing was to pickle it properly.

Mr. J. Murray (Stockport) said one point had been missed altogether. The careful farmer with a good sample of wheat weighing 67lbs. a bushel did not, when the standard was 60lbs., sell that 67lbs., he only sold 60lbs., and had the remaining 7lbs. in hand. But the man whose wheat did not come up to the standard had to give more than a bushel to make up the weight.

Mr. Smith (Naracoorte) moved—"That the Advisory Board take into consideration the advantage or otherwise of wheat being sold in the open market." The system of selling wheat in the open market would get over the difficulty complained of, and would do away with the agents in the country, the expenses connected with which amounted to quite a penny per bushel. Selling in the open market would also result in the man who produced the best sample getting the top price.

The Chairman pointed out that the Advisory Board was constituted of persons representing various industries, and would not have sufficient time to devote to a question of that kind. Consequently, if the resolution were carried it would be of no effect.

Mr. Smith said he would amend his motion to the effect—"That the question of selling wheat in the open market be referred to the Branches for consideration."

Mr. J. B. Thiele (Sutherlands) seconded the motion.

Mr. N. S. Giles (Mount Remarkable) said the quality of South Australian wheat was not only not improving, but was deteriorating, and it was of no use disguising that fact. If farmers were not careful South Australian wheat would be sold at a discount on the London market. If selling wheat in bulk would remedy the trouble, it should have the support of every farmer in South Australia.

Mr. F. H. Lock (Whyte-Yarcowie) suggested that the question of bulk handling of wheat should also be referred to the Branches.

Mr. G. G. Nicholls (Secretary Advisory Board) said that most of those who had spoken on the subject seemed to desire that action should be taken quickly. If the matter was referred to the Branches it would mean a delay of 12 months, and, in addition, past experience had shown that in all probability a number of the Branches would not even discuss the matter. The Congress was a representative one, and he urged that they should deal with the matter at once.

Mr. Trengove (Bute), in reply, said what he complained about was that in selling sheep he was paid according to the condition in which he brought the sheep to market, but in selling wheat under present conditions the farmer did not get paid according to its value.

Mr. H. Billinghurst (Crystal Brook) moved as an amendment—"That this Congress urge the Government to take such steps as may be necessary to make bulk handling of wheat the ordinary process of marketing in this State."

Mr. N. S. Giles (Mount Remarkable) seconded the amendment.

The amendment was carried by a large majority.

POTATO-GROWING.

Mr. A. A. Sassanowsky (Mount Gambier) contributed the following paper:—

In dealing with this subject I do not set myself up as an expert, but will endeavor to give you some idea as to the way in which potatoes are grown around Mount Gambier, more particularly in the Compton Downs district.

The soil in this particular part is not of a volcanic nature, but is a fairly stiff loam with a good clay subsoil.

As you are, no doubt, quite aware, the soil differs a good deal on every farm, and the system of working the land for one farm may not suit another.

My remarks on potato-growing will mainly refer to the Snowflake variety, and to a medium late planting, say, about the month of October; the ground on which the potatoes are grown being planted about every sixth year after the land has been under grass for two years.

It is a general practice to plough the land two or three months before planting, and in doing this the growers have various ideas as to the depth of ploughing, *i.e.*, whether it should be 2in., or 6in. to 7in. deep.

I am not in favor of just skimming the land, for if this is done, the reploughing, in planting the potatoes, has a tendency to form lumps.

By ploughing to a depth of 6in. or 7in. the ground can be well cultivated before planting. The after-working is better, and there is more chance of retaining moisture in the soil when ploughed deeply.

Our next work is the planting of the crop about the middle of October, and it must be remembered that we get some fairly warm days at this period which have a very marked tendency to dry the land. Our object is to retain the moisture, and the only way to do this is to harrow the land ploughed each day twice over (reverse ways). By doing this as soon as possible after ploughing, the land will work down to a fine tilth. Not only is the moisture thus better conserved, but the formation of clods, which are detrimental to after-cultivation, is avoided.

The general method of planting the potatoes is to put the set in the furrow behind the plough. Most of the growers use a cutter made out of an old chaffcutter knife. This is attached to the plough behind the mouldboard and is set to cut a part of the furrow off and leave a track for the man planting to put the potatoes in. I hope the day is not far distant when the planting will be done satisfactorily by a machine, so that the sets are placed at a regular distance apart. The depth to plant is about 3in. to 4in., so that the harrows will not pull the potatoes up.

The working of the land from now on depends on the quantity of weeds which will come before the potatoes make their appearance above ground, which takes from three to four weeks.

We harrow the land twice when planting, and it is a good practice to harrow twice about a fortnight after planting and twice more when the potatoes are up in the rows. This, I maintain, is the principal harrowing, as it is the last time we can get between the plants in the rows without using the hoe.

SEED.

I have spoken, so far, about the cultivation of the land, and now will touch on the quality of the seed and how to keep it.

The first thing to decide is whether to plant round or cut seed. If the former, it is best to pick over the small ones and take the best for seed, bearing in mind that they must come from potatoes that were cut the previous planting. In dealing with large potatoes for seed, it is a good plan to gather them from a part of the paddock where the crop was the best grown, and cull the very large potatoes out so that you do not have waste in planting; and you get a safer "come up" from the medium-sized ones. This way of selecting is a fairly safe one, but it is always desirable to have a complete change of seed every three years, or a few tons every year from which to raise your seed.

The manner of keeping the seed is important, so that we may get a good "come up" and also strong plants. The keeping of the potatoes in trays is a good plan, so that they become green and have short, strong sprouts when ready to plant. It is, in my opinion, far better than pitting or keeping in a barn. When one has from 50 to 100 acres to plant, however, it means a large expense and a good deal of extra work. There is a simpler way of keeping the seed, if not quite so good; but it is fairly satisfactory when planting a fairly large area. Most of the homesteads have a plantation of trees of some kind near the house. Make use of these by spreading the seed potatoes, one potato thick, under them, and leave them there until all have become green. One need not be afraid of frosts, especially under a thick bunch of trees.

STACKING SEED.

Let the potatoes lie on the ground for about two months. Then pick them up, put into bags, and stack the bags in single rows between the trees two bags high. This is done by passing a wire around the trunks of the trees, strained so as to catch the top bags about two-thirds up. Put the wire on before the bags are stacked. It can be left on from one year to another. When planting time comes the seed is carted out to the paddocks and distributed in lengths suited for the planter, and is cut there.

Generally, in the South-East, the potatoes are planted in rows which are about 28in. apart, and the sets are about 2ft. apart in the rows. No manure is applied around Mount Gambier, but in Millicent and Rendelsham it is used with good results.

We have now ploughed the land, planted and harrowed the crop, and the next operation is to scarify. The object in scarifying is to kill the weeds between the rows and loosen the ground ready for the moulder. I have mentioned the importance of avoiding lumpy soil. The scarifier will push lumps and clods to one side and leave them in the rows of potatoes. This is very detrimental to the crop, as when the potatoes are moulded the lumps are partly covered and they become a harbor for slugs and other pests, besides leaving the soil open, so that in the hot weather the moisture dries out quickly.

Finally, I would mould the potatoes. Some growers do not do this, on account of it drying the land very much. On the other hand, you have the advantage of not losing so many, when digging through greenness and worms. If the potatoes are left until the tops nearly touch each other between the row before moulding, the sun's rays have not such an effect on the soil. Set the moulder so as to leave a small gutter on the top.

THE DISCUSSION.

Mr. J. Brown (Port Elliot) would plough the ground to a depth of 12in. for potatoes, and plant the sets about 5in. deep. The potatoes developed above the set which was planted, hence the reason for putting it well down. The crop was improved by selection. It was well, when planting, not to use the very large tubers. A good plant could be raised from the crown eye. The system of keeping the seed which he adopted was to pick out the best, bag them until they just began to shoot, and then spread them out, rubbing off these shoots.

Mr. D. Tucker (Kalangadoo), who mentioned that the writer of the paper was one of the most expert growers of potatoes in the State, said that in his locality the soil was of a stiffer nature than that worked by Mr. Sassanowsky. He did not agree that a change of seed was necessary every three years. Careful selection would obviate the necessity for this. Some years ago he planted a variety which turned out practically a failure the first year. The following year the results were somewhat better. After having been grown for nine years they were at present much better than they were originally. Moulding was a matter that was governed largely by the class of soil. It was better to plant small tubers.

Mr. J. Darley (Narridy) thought that if potatoes were planted in October in his district they would be a failure. It was better to put them in during the first week in July; the risk of frosts must be taken.

Mr. J. Malcolm (Kadina) asked the best methods of cultivation for potatoes on the sandy loams of the Peninsula, and the best varieties to grow.

Mr. J. Dall (Woodside) asked the reason for bagging the seed after it had laid out for about two months. He thought the use of seed from very good roots would give as good results as would be secured if the large potatoes were picked out. He also desired to know whether spindly shoots would grow from any eyes that were cut through. It was a good plan to change the seed. Up-to-dates, especially, would be found to soon run out. Fresh seed obtained from Victoria would do far better than seed from tubers grown for two years in the locality.

Mr. G. R. Lines (Gladstone) drew attention to the manurial value of seaweed in connection with this crop.

Mr. A. Harper (Clarendon) advocated the frequent change of seed.

Mr. N. S. Giles (Mount Remarkable) thought it wise to give new seed a trial extending over at least three or four years before it was discarded as unsuitable to the district.

Mr. Sassanowsky, in reply, said harrowing after the crop was up could be done without danger. It did not pay to select the seed; the better plan was to change it. If they moulded the plants to too great a height there was a likelihood of a large percentage of small potatoes being secured. It was far better to have this, however, than to have a large part of the crop turn green. Potatoes dug in May or June could be planted in October. The reason he bagged the seed after greening was that if they were left out from May until October they would become very hard. By bagging them a mellowness was obtained, and as a result a better " come up " was secured.

RESOLUTIONS OF PREVIOUS CONGRESS.

Mr. G. G. Nicholls (Secretary Advisory Board), reporting on resolutions carried at the 1912 Congress, said the first matter he would deal with was—

SELLING CATTLE BY LIVE WEIGHT.

The resolution affirming that selling cattle by live weight should be given a trial had, at the previous Congress, been carried by a small majority. The Advisory Board had subsequently written to the Pastoralists' Association on the question, and that body had raised no objection to the proposal. The Abattoirs Board was then approached, and, after consideration, decided to take no action in the direction desired. There the matter for the present ended.

SELLING WHEAT BY LOAD OVER WEIGHBRIDGE.

The Advisory Board had written to the Chamber of Commerce in regard to this question, and the following reply had been received from the Secretary of the Corn Trade Section of the Chamber : " I am directed by my Council to inform you that in consequence of the number of centres in this State away from railway stations at which wheat is produced, and in view of the unfavorable reports received from the eastern States, where the proposed system is now in use, my Council are of opinion that your proposal to weigh wheat by load over weighbridges would be impracticable. They further desire to point out that the present method of weighing by single bags is found by traders and others interested to work most satisfactorily, and gives uniformity of custom throughout the whole of the State." He (the speaker) had also, under instructions from the board, written to the other States where the proposed system was in operation, and it was evident from the replies that there was a very mixed feeling in regard to the matter. There the question stood, but if anything came of the resolution carried that morning in regard to the marketing of wheat it would cover the previous resolution in regard to the weighing of wheat.

STUBBLE AND SCRUB BURNING.

At the last Congress prominence had been given to the trouble of burning stubble and scrub in dangerous months, and the inability to burn in safe months owing to the fact that the dates were fixed definitely by the Act. A resolution had been carried asking that the district councils should be empowered to fix the dates as well as the times of day when stubble and scrub might be burned. A Bill to consolidate the District Councils Act was before

Parliament, and provision was being made to give that power to the district councils.

Compulsory Registration of Stallions.

In regard to the resolution in favor of the compulsory registration of stallions, the question had been referred to the Branches, and of the 90 Branches that considered the matter only 71 expressed a definite opinion - 47 were directly in favor of the proposal, eight conditionally in favor, and 16 directly against. The matter had been referred to the Minister, who had sent it on to the Chief Inspector of Stock, who in turn had reported that at a a conference of veterinary officers in Sydney it had been agreed that uniformity of examination and certification of stallions could be attained. The conference had recommended that early legislation should be enacted to provide that uncertificated horses be not allowed to travel for stud purposes. It was considered to be highly desirable that stud books should be established in each State, and it remained for the Governments to decide as to the legislative measures to be introduced. He (the speaker) had communicated with the Minister of Agriculture that morning, and the Minister had replied that he would receive the minute and give full consideration to the resolution of the last Congress in the light of this further opinion coming from the Veterinary Conference.

Stud Book for Draught Horses.

The Director of Agriculture had been asked by the board to deal with the matter of a stud book for draught horses. He had written to New Zealand, and had gathered considerable information on the control of a stud book there. A few months ago the Director had referred to the matter at a board meeting, and indicated that he would suggest to the board that the Royal Agricultural and Horticultural Society should be the body to take up the formation of this stud book. He (the speaker) thought this matter would have been further dealt with had it not been for the unfortunate illness of Professor Lowrie.

AFTERNOON SESSION.

Mr. A. M. Dawkins (member of Advisory Board) presided.

SOME PROBLEMS IN STOCK-BREEDING

Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S., Superintendent of Agriculture in the South-East, addressed Congress on "Some Problems in Stock-Breeding."

Mr. Colebatch (who illustrated his remarks with a number of diagrams) said—I have chosen this subject of stock-breeding because I think it is one of interest to farmers in all parts of the State, and also because it is one which I thought wise to include in an agenda paper which generally contains so many items relating to wheat and wheat-growing. In speaking on the problems of stock-breeding I had either to include in this address a large number of problems and deal with them in a perfunctory manner, or confine myself to one or two of the more pressing and speak on them at a greater length. I have chosen the latter course.

INFLUENCE OF AGE ON REPRODUCTION.

The age of the animals selected for breeding purposes, at the time of mating, has an important bearing on certain phases of the reproductive processes. In a general sense this may be said to be a well-recognised fact amongst stockmen, but much difference of opinion obtains as to the precise nature of the influence of age both on the parents and the progeny, and correspondingly we find widely differing practices are being adopted, according to the tenets and beliefs of the individuals responsible.

It is not always possible to adhere to systems accredited by both science and traditional experience. Circumstances may arise that make it expedient to depart from well-proven methods, but it will be well for us all to keep the known facts prominently before us, so that whenever discretionary power is within our grasp the opportunity of turning it to best account may not be lost.

An examination of the subject of the influence of age on breeding problems enables us to divide it up into several sections as follows: 1. The time to commence breeding. 2. The time to cease breeding. 3. The rate to continue breeding. 4. Influence of age on mating systems. 5. Influence of age on fertility. 6. Influence of age on quality of progeny.

INFLUENCE OF AGE ON PRODUCTIVE PERIOD AND RATE OF BREEDING.

We will discuss the first three sections together. The age at which animals should first be used to propagate their kind has been the subject of controversy from very early times. Even to-day we find two schools of opinion persisting, but the steady diffusion of knowledge regarding the principles of general and sexual physiology will in time remove many of the misconceptions which have grown up round the subject. In his work on "Horse-breeding" Reynolds sums up the position in general terms when he states that "subject to the influences of early precocity or contraction of disease, the age at which draught stallions and mares may be employed for breeding purposes is prescribed only by the natural development and decline of procreative power, but the periods of life when they may be profitably used are more limited." The last section of this statement touches upon one of the most important aspects of the whole problem. The question of the age at which to start farm animals breeding resolves itself more or less into a profit and loss calculation. "Breeding from babies," as early mating is sometimes called, may be warranted under certain special circumstances, but most will agree that the general concensus of opinion amongst breeders of to-day is opposed to the practice of mating either male or female stock before they have had time to ensure the proper development of their own frames and constitutions.

Prominent amongst those who advocate the mating up of immature animals is Captain Olver, who, in his article on the "Hygiene of Breeding" says in reference to young stallions, "It is a pretty general custom to allow him to serve a small number of females at quite an early age, and gradually increase the number; and we think this is the best system, provided that great care is taken to prevent him doing too much work until he is fully developed." Further on in the same essay he goes on to say --"In the case of the female, also, we think it is a good system to get her to breed at quite an early age, provided she can be maintained in extra good condition throughout the period of pregnancy and subsequently." Both these statements are rather vague, inasmuch as the phrase "quite an early age" admits of many interpretations; but it seems clear, from the cautious character of the provisory clauses, that the author had in mind breeding from animals that were not sufficiently developed to exercise their procreative faculties without calling for special care and attention to enable them to come through in healthy, thrifty condition.

Amongst breeders of racehorses, pedigreed stock for special purposes, and fancy breeds of all classes, such advice might be well received, as every care is bestowed on the stock that constitute studs of this character; but it is just that extra special attention that the animal employed in trade breeding is in very great danger of being compelled to do without. On this account, and for other reasons shortly to be referred to, early mating under ordinary farm conditions is apt to be dangerous to a serious degree. A better grip of the facts will be obtained if we consider closely the arguments put forward by the advocates of both systems.

Those who adhere to the practice of early mating do so for the following reasons:—

1. They claim that experience has demonstrated that the progeny of such unions are frequently of high quality and stamina. Many notable instances may be cited in support of this contention. The famous shire champion "Bury Victor Chief" which won the Challenge Cup of the society in 1894, and which changed hands two years previously at the record price of 2,500 guineas, was foaled by Bury Daisy at 3 years of age. Evidence of this kind, however, is not convincing, for it should be remembered that "of the huge total of animals so bred, those which have achieved fame at the ring or at the stud form a very small proportion and lend no sort of encouragement to the adoption of early breeding as a general system." Indeed, it is more than likely that the proportion of animals thus bred which have thereby been handicapped out of the struggle for distinction far exceeds that limited proportion which has reached the front rank.

2. It is further asserted that no apparent ill consequences follow as long as good judgment is shown. In reply it may be said that so far as apparent evil effects are concerned it is difficult to form an opinion, inasmuch as it is beyond any man's power to gauge the inhibiting influence of early breeding on development. Comparisons with similarly bred animals that have not been mated early may be interesting, but they can never furnish criteria on which to form sound judgment. It is probable that the deterioration is a gradual process, and whilst not strikingly apparent in a single generation, being cumulative, it will ultimately come to be plainly observable. Defects that are traceable to this cause are usually very difficult to eradicate. In any case, if applied to any but the most experienced breeders the argument must be regarded as unsound, since it leaves far too much room for the display of faulty judgment.

3. Early breeding is said to be beneficial in that it causes the generative system to attain its full development at an early stage in growth, when the frame is capable of considerable expansion and modification of form. In this way it is believed to lessen the risk at subsequent births, and so enhance the value of the animal as a safe breeder. The truth of this will be generally conceded, but it must not be overlooked that there is a higher mortality from difficult parturition amongst animals that have been bred very young than in the case of those that are better grown. And again, although much stress has been laid on the mouldable nature of the skeletal and other structures in the immature frame, the pelvic girdle will still respond to the normal expulsive efforts during birth when the physical development is a little nearer completion.

4. Those that have bred early are said to be more reliable as breeders. So far as can be ascertained, this conclusion has not yet been substantiated by reliable data. On the contrary, statistics would appear to show that very young animals are not generally reliable as breeders, and there is difficulty in finding a reason for supposing that animals bred before mature are on that account more trustworthy as breeders.

5. In precocious animals with high spirits there is less danger from accidents, and in the case of some male animals less risk of vicious habits if early mating is resorted to. This is good sound reasoning, and as an argument in favor of early mating in special instances it will be supported by most breeders. The check to development in unbred heifers through the frequent recurrence of "heat" (two or three days every three weeks) is advanced by dairymen as a reason for early mating. Such cases of necessity, however, are far too infrequent to justify the general adoption of the system.

6. In the case of high quality stock it is often deemed desirable to ascertain the breeding qualities at an early age, and further, under certain market conditions, it may be advisable with certain classes of stock to sacrifice, temporarily, future interests for immediate profits by instituting early breeding.

The possibility of temporarily resorting to early mating advantageously under special economic circumstances must be granted, but such practices should not be preferred as justification for according support to the view that under ordinary working conditions breeding from babies is better than breeding from well-grown stock approaching maturity.

Wortley Axe, who strongly discountenances the use of partly-grown animals for stud work, has laid it down that " no one with any knowledge of the laws of life can doubt that to impose upon a mare the task of reproduction whilst actively engaged in building up her own frame, and to ask her subsequently to support her offspring, is a certain means of retarding her growth, if it does not also enfeeble her constitution." In other words, it is to be regarded as a distinctly risky process that cannot be supported on any sound physiological grounds. It has been truly said that the highest physical development is reached when the nutritive resources of the system are devoted exclusively to its own maintenance and not shared by the growing fœtus. By draining the body through the generative organs before maturity has been approximated to, the size, condition and general health are apt to be impaired, and it is important to remember that an impaired constitution means increased susceptibility to disease and diminished recuperative powers. Having regard to the dangers attendant on prolonged convalescence, the advantage of breeding and rearing strong, hardy types is very evident.

A further reason for inveighing against the prevalence of early mating is the danger of abuse to which the system lends itself. The attendant evils will naturally be more apparent in the case of females, but much harm may also result in the case of males by over use and over stimulation through high feeding and possibly drugging.

In actual practice it is not contended by many that physical growth and development should be complete before the sexual powers are called into action. Saunders has observed that " there is no horse but would be the better for absolute continence until he is fully matured," and no doubt from a physiological standpoint this is strictly correct; but, as already stated, the question cannot be settled without reference to the economics of stock-breeding. There are undoubtedly advantages to be gained by not waiting till the maturing processes are absolutely complete, and experience teaches that under domestication it is possible to reap these benefits without detriment to the breeding stock. It is, however, regarded as essential that as a general rule what may be termed the critical period of growth—that is, the period in which the proportion of assimilated food utilised in the formation of new tissues is high, relative to the amount required for purely maintenance purposes—should have elapsed before the reproductive functions are exercised. The actual stage of development when this critical period has passed will differ with the class, breed, and individual; but experience has prescribed the ages at which stock-breeding may be safely commenced under average conditions. These we may now consider in connection with the different classes of farm animals.

HORSES.

With colts the usual practice is to allow a few mares when two years old, but unless there are special reasons for doing so it would be better to defer service till a year older. With well-furnished colts that are too "fresh" to settle down properly, an allowance of eight or ten mares may be given. It is better to let the services follow quickly on one another, so that the stud work may be soon over, and the colt will then be more likely to calm down and develop his system without fretting, than if the stud work be distributed over a long period of time. As three-year-olds an allowance of from 20 to 40 mares for the season will be sufficient. This gives a fairly wide range, and discretion must be shown, for it is known that there is a vast difference between the sexual proclivities of animals of the same breed and strain.

I would draw special attention to these figures in respect of three-year-old stallions, as I am inclined to think that many of the New Zealand and Victorian colts of that age which have found their way into this State have been worked at the stud far more than they should have been, and their conformation and reputation as sires will in many cases have suffered as the result. Even in older countries, where breeding stock are housed most of the year and fed heavily with concentrated foods, it is not advisable to exceed the above figures as a general rule, and it is hardly likely that greater liberties can be safely taken under our system of working. When four years old from 50 to 70 mares would be ample, and on reaching maturity in the fifth year the number may be raised to 90 or 100 per season. If stallions were brought to their work gradually in this manner there would be small need to resort to arsenic, strychnine, yohimbine, or other aphrodisiac drugs to pull them through the season. Furthermore, there is a grave danger that colts that have been used to excess when young may give way in the hind legs and become temporarily, if not permanently, impotent. With reference to stallions in full use, the number of mares served—within reasonable limits, of course—seems to have little effect, provided the condition be maintained; but if this knowledge be taken advantage of, and the horse be used to excess for a long period, partial or complete loss of virility may ensue.

In the Government breeding studs of Germany it used to be held that better results would be secured by restricting the number of mares to 15 or 20 per horse, but they have gradually increased the allowance, till to-day a stallion in full vigor is allotted 100 or more. From the official statistics of horse-breeding in Saxony it appears that the highest percentage of foals over a period of seven years was obtained from horses serving from 80 to 100 mares, and similar results were secured with the French studs. The number of mares, however, must be varied with the known capacity of the animal and the condition and vigor, which will themselves vary from season to season. Naturally a horse that succeeds in stinting his mares with very few services will be able to take more than one whose mares are continually coming back to him.

Fillies are commonly bred from as two-year-olds, but in my opinion this is a practice that, except under special circumstances, cannot be too strongly condemned. Fairly well-grown stock should not be mated till the spring of the third year, and if at all backward they should be held back till rising four years old. When young mares have been stinted as two-year-olds it is advisable not to subject them to more work than is necessary to break them in. They should be allowed to rest from the time of conception till the foal has been suckling for at least two months, and they should be well fed the whole time. It is usual to allow them to miss breeding the following year in order to develop their own expanded frames, and their second foal will then be dropped in the fifth year. As a general rule, however, biennial breeding is to be discouraged. In properly nourished stock it is found that the mares do better and breed better if they conceive every year, and naturally mares that produce a foal annually are more profitable to the breeder. The generative organs appear to lose their tone and are apt to undergo degeneration if the intervals between the births is unduly prolonged ; and it is better, therefore, to feed well and keep the mares breeding regularly from maturity onwards. Mares that are brought to the stud late in life are rarely a success, owing to the atrophied condition of the organs of reproduction through disuse, and even if they do breed and are judiciously mated the foals are generally unthrifty weaklings.

CATTLE.

Amongst dairymen it is often considered advisable to calve down heifers at two years of age, for the reason that it is thought this early breeding has the effect of strengthening and encouraging the free flow of milk. If the heifers are subsequently kept milking as long as possible, and the second conception be deferred till late in the lactation period, there is little doubt that the system has an influence in this direction ; but is not this advantage likely to be gained at too great a cost ?

It has been argued that the case is not on all fours with the early breeding of horses, where the development of bone and muscle are of pre-eminent importance. In dairy stock we are concerned with the milking capacity, and are therefore primarily interested with the number and activity of the secreting cells of the udder. It is impossible, however, to get away from the fact that breeding continuously from immature and undersized stock will in the end result in the production of smaller types and in the weakening of the constitution. Such early mating will be followed by arrested development of the mother, loss of stamina in the calf, and unless the choice of heifer has been well made and the food supply well maintained, there is a distinct danger that both mother and offspring may become irretrievably stunted. By holding back for another four to six months the loss of time incurred through having to defer the second mating of early-bred heifers is not experienced. With very forward heifers, or those that are being retarded in growth through sexual excitement, early mating may be justifiable, but when the progressive improvement of the herd is the purpose in view it will be found better general practice to defer calving till heifers are not less than 28 months or two and a half years old. There will then be less trouble in calving, and all the benefits claimed for earlier mating will still apply. I refer to such statements as that pregnancy has a stimulating effect on the system, encouraging assimilation and hastening growth, and also that it is easier to develop the milk-secreting organs at an early age. Amongst beef-breeders the necessity for breeding from well-grown stock is well known, but in pedigreed herds, where it is so important to get an early hint as to the breeding qualities, early mating is frequently resorted to.

Bulls are usually purchased very young, and the tendency is to use them on the herd far too early. In farm practice they are better not used whilst under 1 year old. Between the ages of 1 and 2 they are not likely to suffer by being allowed, say, 15 or 20 cows, and when over 2 they may be used freely till their powers begin to fail. Bulls of the heavy breeds are usually less prolific than the lighter and more active types, but an average allowance for bulls in full vigor of from 60 to 80 cows is not excessive when the services are well distributed.

SHEEP.

In order to keep up the lambing percentage the ewe flock is generally well culled for age each year. In the warmer areas of this State, where development is very rapid, it is usual in farm flocks to mate up the hoggets, but in the southern districts such early mating is too often followed by a disastrous lambing. It is very largely a matter of growth and condition. The pernicious effects of continuous early mating will undoubtedly apply as much in regard to sheep as in other animals, but as the hoggets form only a proportion of the breeding flock the resulting deterioration would be obscured, and the annual culling of poorly developed ewes will act in a measure as a corrective. Moreover, when Merino two-tooths are mated there is generally a fair percentage that fail to get in lamb. In actual practice, therefore, it is difficult to perceive any injurious results, and from the pecuniary standpoint the advantages of mating hoggets are quite obvious. This, however, must not be taken as a proof that the physiological principles on which the objections to early breeding are based may be safely set aside. Were sheep-breeders to restrict their operations to the mating of hoggets for a season or two the loss of constitution, loss of size, and increased losses at lambing time would soon become apparent. In the hands of careful men it is possible that the system may be employed in suitable localities without undue risk; but, in order to get the best results by it the feed must be plentiful and the hoggets practically as well-grown as four-tooths in colder climates.

A few years ago the use of ram lambs became fashionable in certain parts of England, as it was held that they got a larger percentage of twins. The theory was inquired into by W. Heape, at the instance of the Royal Agricultural Society, and he was able to show that the ram lambs were in no way responsible. He proved that in those flocks where ram lambs were used with this object a full share of twin lambs were dropped by portions of the flock that had not had access to ram lambs. The same practice was tried in this State, but as Mr. Jeffrey observes in his book on "Sheep and Wool," "It is noticeable that many who adopted this practice have since discontinued it, and they are content to wait till the ram has further developed." Four-tooth rams should not be allotted the full number when worked separately, as they are not then fully grown. About half the usual number will be sufficient, but after that age they may be given from 50 to 100 ewes according to their condition and age. Where fat lambs are being bred for young rams are much to be preferred, as being likely to increase the rate of growth and aptitude to fatten.

PIGS.

As in the case of other stock, when pigs are bred too early they suffer in themselves and produce degenerate litters. Since they are generally forced along with abundance of rich food their sexual propensities develop very early, and there is a temptation to mate them up before they are well grown. Some use them at 6 months, and others hold them back till they are a year old, but it may be considered quite safe to breed either boar or sow at 8 or 9 months.

INFLUENCE OF AGE ON FERTILITY.

Reasoning by analogy from the conclusions of Duncan with reference to the human species, it would appear that the fertility of female animals rises rapidly from a condition of sterility to a climax, and then declines again very gradually till sterility is again reached. Probably the same is true of males, but in their case the change from initial sterility to the highest degree of fertility would seem to be more abrupt, and the ability to procreate appears to persist longer.

The following table sets out the extreme limits of age at which breeding has been known to occur in farm animals, and it also shows the duration of the profitable breeding period.

	Earliest Age.	Latest Age.	Profitable Breeding Period.
Mare	11 months	38 years	3 years to 15 years
Cow	2 months	29 years	2 years to 10 years
Ewe	3 months	24 years	1½ years to 5 years
Sow	3 months	—	8 months to 6 years

Although the useful productive period for mares is given as from 3 to 15 years, the procreative powers of many begin to fail at about 12, and reliable breeders well up in the "teens" are by no means common. Similarly in the case of cows, breeding becomes too uncertain after 12, and sometimes they will require culling a year or two earlier. Ewes vary considerably in the age at which they cease to breed regularly. Some are unreliable at 4 or 5 years, whilst others may continue till double that age; but as they are generally cast when they begin to break in the mouth, they are rarely kept for breeding after the profitable period has elapsed. Sows generally breed satisfactorily till 5 or 6 years old, but they are inclined to become vicious and clumsy as age advances, and are not often retained till their breeding powers are on the wane. Stallions have proved themselves fertile before 12 months, and, according to Aristotle, have been known to beget foals at the age of 40. It is difficult, however, to discover evidence as to the effect of age on the procreative aptitude of male animals.

The highest percentages of foals begotten at the Saxony studs for the six years 1856-61, inclusive, were sired by horses of widely differing ages, as shown in the table—

	Highest Percentage.	Second Highest Percentage.	Third Highest Percentage.
1856	6 years	19 years	12 years
1857	4 years	20 years	14 years
1858	9 years	10 years	5 years
1859	Nearly uniform in all ages		
1860	17 years	18 years	19 years
1861	Nearly uniform in all ages.		

In the succeeding year the 10-year-olds headed the list, whilst the 20-year-olds threw twice as big a percentage as the 4-year-olds. These results are interesting, and they appear to bear out the view that fertility in the male sex is less a matter of age than a question of condition and management. Another remarkable record which is pertinent to the subject is that of the famous American trotting horse Rysdyk's Hambletonian 10. This stallion was at the stud for 23 years—he was not used in 1868—and threw 1,331 foals from 1,930 mares, which works out at 69 per cent. The average number of mares served per annum was 83. If we except the last year, when his health was evidently breaking up, it will be noticed that the yearly percentage of foals begotten was exceedingly uniform, and that the fertility was scarcely if at all, influenced by the age of the horse.

German Breeding Studs.

Before leaving the subject of the fertility of stallions, it will be instructive to refer to the results obtained at the Government breeding studs in Germany. The records have been carefully kept for a series of years, and by combining the results of the 11 breeding stations over a period of 15 years the average percentages for over 1,000 stallions and 42,000 mares per year work out as follows:—Average percentage of mares in foal, 67·7; average percentage of live foals dropped, 53·3; average percentage of abortions or miscarriages, 4·8; average percentage of mares dying or not accounted for, 9·6.

Considering that these results are the averages for a total of 15,000 stallions and 630,000 mares that have had the benefit of good management they may be expected to be slightly above the general average under ordinary farm conditions. Country stallions have frequently to accept mares that are utterly unfitted for breeding, and their percentages will suffer accordingly, but on the other hand many good horses will come through the season with much higher results than the average secured in the official studs of Germany. If we assume that the above figures may fairly form a basis for calculation in our own State, the stallion that is advertised to stand the season for £2 could,. with a booking of 100 mares, afford equally well to stand at the rate of £1 down and £1 10s. when the foal is proved, or £1 down and £2 on the production of a living foal. In practice no doubt this margin would be found too narrow, but the figures will serve as a means of comparing the risks in the case of sound, healthy horses that are entitled to be called "sure."

Unfortunately there are no reliable data available as to the records of fertility in other classes of stock. It is everywhere admitted that in multiparous animals the first litters are smaller in number than those obtained later in life, and it is known that twin calves or lambs are rarely the result of first impregnations. The same general conclusions, however, may be safely applied in all cases. Age is not without its influence on the extreme limits of the producing period, but as a determining factor during the profitable breeding period it is of much less importance than the proper dieting, housing, and general management from babyhood to parenthood and throughout the stud career.

INFLUENCE OF AGE ON QUALITY OF PROGENY.

One frequently hears it said that very young and very old animals are less likely to produce offspring as robust and of as good quality as those in the full vigor of life. The subject has not been very closely studied, and we are as yet unable to say to what extent the fitness and keenness of the animals when mated may influence the vitality and development of the resulting progeny. It is reasonable, however, to believe that they have such an influence, and therefore it is a point that all stock-breeders should take into their calculations. To some extent the inferiority of the progeny of many young animals may be due to the fact that in primiparæ the milk glands are often insufficiently active, and the progeny is in consequence deprived of a good measure of that share of " breeding " which is said to " go in at the mouth." Matrons also are rightly regarded as better mothers than young dams, and their offspring gain a better start in life. In the case of old age in either male or female improvement is less likely to result by breeding, and the offspring will in all reasonable probability be born in a poorly nourished condition, and, if reared, will be small and weedy. It is a common practice on many farms to retain favorite old mares after they have been pensioned off and let them breed, but in many cases I am convinced it would be kinder and less costly to let them end their days in peace.

We have next to consider whether differences in age within the limits of the period of profitable breeding will affect the quality of the progeny. The term quality may refer either to symmetry of form and character of hair, skin, bone, and tendon, or to ability to perform well on the track. In both cases, however, the age of the parents within such limits would appear to have little or no influence. The old English blood mare Pocahontas bred Auracaria (a noted brood mare) at 25 years. Hambletonian X. sired his fastest son when 8 years old, his next fastest at 16, and the next at 21. Electioneer's three most noted gets were sired at 17, 13, and 21 years respectively, whilst Volunteer produced his best at 12, 9, and 7 years. Examples might be multiplied indefinitely, but sufficient have been quoted to confirm the statement that, if judgment be shown in the mating, stock of high quality are as likely to be produced towards the close of the profitable breeding period as at the commencement or during the middle phase.

INFLUENCE OF AGE ON MATING SYSTEMS.

It has already been pointed out that both young and old stock are uncertain breeders, and it is therefore possible to understand why the best results are not obtained when the influence of age is overlooked. In practice it is found that in order to secure a high percentage of increase, and to favor the production of the best quality stock, young females should be mated with vigorous well-seasoned males, whilst those that are approaching the finish of their breeding careers are better put to sires that still retain the freshness and vitality of youth. The combination of young females with robust males is more likely to bring about successful " nicking " than the use of old females with young sires; and after all it is every breeder's ambition to so blend the strains as to enable him to make some appreciable contribution to the improvement of the breed. When dealing with stock that are in their prime the choice of suitable mates will depend on physical and temperamental characters and on the known breeding capacity, but preference will generally be given to sound hardy types that have passed through the early stages of their stud work.

RELATIVE INFLUENCE OF SIRE AND DAM.

There has been a vast amount of speculation in regard to this subject, and, as is usually the case with vexed questions, very decided opinions are held concerning it. Many writers have dealt with the matter, and they have varied a good deal in their views. Some have maintained that the male parent influences more particularly the musculature and general outward appearance, and so affects chiefly the conformation and locomotory powers, whilst the female is responsible for the development of the internal organs. This, I believe, is a very popular theory amongst practical men, and as such is deserving of searching examination. There will arise in the minds of breeders of livestock instances within their own experience that appear at first to offer irrefutable proof of its accuracy, but in the great majority of cases the confidence reposed in this ingenious theory will be found to rest on second-hand evidence and tradition. Various modifications of this theory are revealed by a study of the literature on the subject. Other writers aver that the male determines the conformation of the forehand, upper parts of the body, and extremities, also strength and mental qualities. In this instance the female controls the height, volume of trunk, and posterior conformation. Again, it has been said that it is reasonable to expect that each parent will be particularly liable to influence the characteristics that are specially developed in the sex to which they belong. In other words, it is to be anticipated that the masculine attributes of the progeny will be traceable to the sire and the feminine attributes to the dam. Further, on account of the intimate and prolonged connection between the mother and offspring, it has been assumed that the influence of the former in moulding the character of the young will predominate.

Thus it is seen that there is a great diversity of opinion as to the relative influence of the sexes amongst those who believe that it is possible to confine the direction of growth and development within the narrow limits of a so-called "law."

Observant breeders must have noticed that even offspring of the same parents frequently exhibit such diversity of type and character that it is by no means an easy matter to detect marked resemblances to either sire or dam. It is true, of course, that instances of prepotency are very numerous and at times very striking, and when it happens that a sire possesses in marked degree the capacity to stamp his own likeness on the bulk of his progeny it is possible that the temptation to generalise from insufficient data may lead a man to think that perhaps the male does affect more particularly the outward appearance of his offspring. So far as is known, however, there are no good grounds for thinking that when parents of equally pure lineage and strength of character are used the development of the young will be influenced more by one than the other. The problem is not one that can be readily submitted to experiment. Even if it were feasible to eliminate the confusing effects of atavism, variation, and prepotency it would be profoundly difficult to solve, and with Nature's laws unfettered it becomes infinitely more so. All that can be said at present with any pretension to accuracy is that under ordinary conditions the "laws" of prepotency, reversion, and variation suffice to explain the experiences that favor the theory of relative influence of the sexes, and that when none of these "forces' are in operation the process of development will be influenced by the parents in an equal degree. (Applause).

REPLIES TO QUESTIONS.

Mr. A. Beviss (Strathalbyn) said he had had 38 years' experience in horse-breeding, and he considered that the address given by Mr. Colebatch was the most exhaustive and instructive he had ever heard. (Applause.)

In reply to questions, Mr. Colebatch said stallions that were kept in countries where the natural feed was better and stronger were more capable of serving a large number of mares than those kept under Australian conditions. Whilst he thought there were many horses in Australia that were sufficiently strong foal-getters to cover a hundred or more mares and get a high percentage of foals, there was also a large number that would be better with half that number. There was room for a good deal of improvement in the way some of the stallions in this State were kept. Farmers whose mares were being put to these horses should interest themselves in the number of mares that each was serving.

Mr. W. H. Smith (Naracoorte) congratulated Mr. Colebatch on his excellent address. He desired to know whether it was better to breed " bone to bone " or " hair to hair."

Mr. Colebatch did not think they could afford to discard the importance of a certain amount of hair. Farmers should endeavor to breed a good class of bone ; where this was secured, generally the quality of the hair would be all right. If the hair were too fine, this would be secured at the expense of the bone. They should aim at the average by trying to breed quality into the coarse mares and roughen up those that were getting too fine.

Mr. A. L. McEwin (Blyth) said the first foal from a young mare would generally follow the horse very closely ; older horses should be used on these, but subsequently younger horses should be used.

Mr. J. Brown (Port Elliot) asked whether the crossing of a mare with an inferior horse affected the subsequent foals.

Mr. Colebatch did not think an absolute case of telegony had ever occurred. Like the question of transmission of mutilations, it was one of which positive proof could not be established. All that was established was that it could not be experimentally produced. Experiments had been made with all classes of stock, and in not one single instance had it been established. Several cases which appeared to be instances of telegony could be well explained by ordinary natural laws.

Mr. W. B. Russell (Loxton) asked whether stringhalt was caused through the early use of stallions.

Mr. Colebatch replied that the cause of this trouble was not definitely known. Anything that would tend to tax the muscular supply in a beast that was predisposed to the disease would probably bring it on.

Mr. J. B. Beck (Wynarka) asked whether it was advisable to have a mare served twice.

Mr. Colebatch said there were many mares which were highly strung and which were unable to retain the seed of the stallion long enough for impregnation to occur. In these cases the first service would go a long way to allay the excitability, and with the second service there was a greater chance of success.

Mr. H. Billinghurst (Crystal Brook) asked whether a percentage of 67.7 per cent. was considered a fair average get in this country.

Mr. Colebatch thought the percentage for this State would not exceed 50 per cent. In so far as travelling stallions were concerned, a better system would be for the risk of the foal to be borne by the two contracting parties. Farmers were well advised to pay a little for the insurance of the foal.

IRRIGATION ON THE FARM AND GARDEN.

Mr. A. J. Bray (Gawler River) read the following paper dealing with "Irrigation on the Farm and Garden":—

The practice of irrigation is of ancient origin. The ancient Greek and Latin writers make reference to its use. The Egyptians, Babylonians, and Phœnecians excelled in the art Many of their embankments and aqueducts were of a nature which modern engineering science would not despise. Their methods of raising water were in most instances of a very primitive nature; and it is in this direction that the greatest advance has been made. Australia is a country subject to periods of shortness of rainfall. Water conservation and means of irrigation are essential to the regular production of garden produce and summer fodder. A bold policy of water conservation, where practicable, would do much to lessen the disadvantages of periods of drought. If water which now flows to waste in many of our watercourses during the rainy season could be conserved, hundreds of acres could be irrigated. Summer fodders could be grown to the great advantage of the dairying and other industries. Plots of early autumn and winter feed could also be started by its agency. In some irrigation settlements the producers depend almost entirely upon irrigation for their supply of moisture. I do not, in my paper, intend to deal with conditions such as these, but rather with those where irrigation is resorted to as a means of supplementing the natural rainfall. Where surface water may be impounded in dams or reservoirs, distribution is by means of channels, fluming, or piping. There are many localities where no such supplies are available, but below the surface water may be obtained by sinking. Where water is procurable by means of wells or bores, appliances are required for raising it. Of motive powers commonly in use the windmill is the cheapest. True, the driving power is fluctuating and somewhat uncertain, but if storage be provided, the windmill will raise sufficient water to irrigate small areas of garden or fodder plots. On many farms windmills are in vogue as a means of raising water for stock. The capacity of the mill and the water supply are often greater than the requirements of the stock. Under these conditions what is simpler than to lay down a plot of lucerne and irrigate it with surplus water?

RAISING THE WATER.

I have not had opportunity for actually testing the results of large mills with direct action, or smaller geared mills, but from observation I believe that in a given time the smaller geared mill will give better results, especially with wells of a fair depth. The light winds, which fail to drive the larger direct action mills, keep the geared ones in motion. The advent of the oil engine has provided a power which is eminently suitable for driving irrigating plants. The motor or petrol engine may possess advantages in the matter of quickness of starting, but the oil engine, being heavier in construction of slower speed, and less costly for fuel, will, for constant work, prove most satisfactory.

A good margin of power is always advisable in oil or petrol engines, as if working up to the limit, there will probably be stoppages and loss of time. For wells of shallow depth, centrifugal pumps give good results, throwing a large stream of water. Their cost is also very moderate. Where, however, the water has to be carried a distance, or the lift is more than 40ft., force pumps will prove more satisfactory. In regard to underground water supplies in the form of springs, there is yet much to learn. While divining rod experts may not be infallible, it seems that there is some basis for the belief that water supplies can be discovered by the agency of the divining rod. The matter is one worthy of close investigation, as the presence of good underground water supplies at a reasonable depth opens up great possibilities in the way of irrigation, and, by its agency, intense cultivation. If the divining rod expert could with reasonable accuracy reveal the best localities on which to sink, the probable depth, and supply of water available, much useless expenditure of labor and capital could be avoided. Springs vary very considerably in quantity, quality, and depth, a few chains interval often giving very different results. The subject is of such importance that further investigation by experts would seem justifiable.

QUALITY OF WATER.

One question of great importance in irrigating is the quality of the water. Unless the different results upon trees or even lucerne by irrigating with different qualities of water had actually been seen they would hardly be credited. A gentleman in Gawler had some orange trees which were irrigated with water from the Gawler reservoir, when supplies were obtained by pumping from a well in the town. They were miserable specimens. When the town was supplied with water from the Barossa reservoir, and the trees irrigated with this, the changed appearance was marvellous. In every other respect the treatment was the same, but the different water transformed the trees. A fruitgrower on the Gawler River some seven miles below the town irrigated his orange trees freely with water from that river. The result was disastrous. The proportion of minerals present in the water during the summer months was so great that the trees were being poisoned. Since the same trees have been irrigated with water from the Barossa reservoir a marked improvement has resulted. The trees, which bade fair to die out, are now profitable. Where the results of irrigation seem unsatisfactory, an analysis of the water would often give a solution of the trouble.

Humus Supply.

Where irrigation is resorted to, it is necessary to apply manure. Irrigation tends to consolidate the soil and remove the organic matter. Stable manure is, of course, the best to apply, but where not available any form of vegetable matter will prove beneficial in keeping up the supply of humus in the soil. Continuous irrigation, without such replenishing of organic matter, tends to sour the soil. This explains why gardens once flourishing seem no longer to maintain their productiveness and the soil to have lost its openness and fertility. The fruitgrowers of the irrigation settlements in the Goulburn Valley, in Victoria, have had to change their methods on this account. Where formerly, by careful cultivation, they never allowed any weeds to grow in winter, they now find it necessary to encourage their growth. They sow peas, barley, &c., for the purpose of ploughing in, in order to keep up the supply of organic matter and prevent consolidation.

Cost of Water.

The question is sometimes asked as to whether it will pay to irrigate with water at 6d. per thousand gallons, the price for excess water in some of the water districts. I am doubtful as regards lucerne or other fodders whether it will on a commercial scale. I believe, however, that it will pay every keeper of stock to use water at that figure, if no cheaper supplies are available, to grow a small area of lucerne or other fodder. Such fodder, though not available as a regular article of diet, will, if used occasionally, when no other green feed is available, tend to keep stock healthy, thus proving a profitable investment. The fruitgrower can profitably utilise water at 6d. per thousand. One or two applications of water to trees when fruit is maturing often make all the difference between success and failure, and transform an indifferent sample into a good, marketable article. Even citrus trees, which require more moisture than deciduous trees, can in most seasons be profitably irrigated with water at 6d. per thousand. Cultivation after each irrigation prevents rapid evaporation, thus enabling the producer to do with less water.

Means of Watering.

Producers differ as to whether it is more profitable to apply water by means of sprinklers or surface watering. Where the subsoil is of a clayey nature and not too absorbent, I favor surface watering. On limestone rubble formation or uneven ground the sprinklers are the only satisfactory means of evenly distributing the water. It is claimed that the sprinklers most nearly approach the natural rainfall; but too often atmospheric conditions are not in keeping when the moisture is being applied, and there must be immense waste by evaporation during hot winds. My personal experience has been that vegetable plots in summer time thrive better with surface irrigation by means of drills than by overhead watering by sprinklers. Where an abundance of water is available, flooding the whole surface will prove most satisfactory. The soil must, of course, be graded, and if of a porous nature, divided off into small sections. When irrigating trees, especially large ones, as much as possible of the surface should be covered with water. Too often when water is applied in narrow rings the outside roots do not reap the benefit of it, and accordingly they suffer.

In conclusion. The benefits of irrigation are undoubted. The question the producer has to consider is not whether others in more favored localities can profitably irrigate and reap advantages beyond his power to gain, but whether, under his conditions, it will repay him. The advantages of a supply of green fodder during the summer months to the dairyman are undeniable. Irrigation, in ordinary seasons, alone renders this possible in many localities. A large increase in water conservation and a greater resort to irrigation will prove to be important factors in developing the rural industries of the State. (Applause).

THE DISCUSSION.

Mr. Ricks (Cherry Gardens) considered the question of irrigation one of the most important producers could discuss. Mr. Bray's paper contained a lot of practical commonsense. He personally was getting a living off 20 acres. He had two sons—one 28 years and the other 15 years; he also employed a married man, and they were all working on the 20 acres. That was a result of irrigation. They had an oil engine and conveyed the water to where it was wanted in pipes, using sprinklers. His experience should encourage those who had a supply of water to make good use of it.

Mr. W. H. Waters (Renmark) said he had occasion to know that Murray water at low periods of the river was very injurious to plant life. His idea of a model irrigation block was reclaimed land where the water was let on the land and then pumped out by means of drainage.

Mr. J. Malcolm (Kadina) said with proper manuring and judicious watering he could make irrigating pay at 2s. per 1,000galls. for water. His farm was on the coast, and he could assure those similarly situated that if they used the seaweed for bedding and afterwards as manure they would find a wonderful improvement in the production of the soil.

Mr. H. Billinghurst (Crystal Brook) said the question of the cost of water was very important, and one that might well be considered by Congress.

He would like to know, seeing that the reservoirs were the property of the whole of the people, why those living in the north should be charged so much more for water than were those living in the south. He moved—"That in the opinion of this Congress it is advisable that the Advisory Board bring the question of the difference in the charges made for water before the Government in order that producers living in the north may get some redress for what is considered a very great grievance."

A delegate did not think those served from the Beetaloo and Bundaleer reservoirs should be charged more for water than people in the more favored districts. He seconded the resolution.

Mr. Malcolm asked the opinion of the Chairman as to whether the putting of the motion would not be introducing politics.

The Chairman said he did not think so.

Mr. Malcolm pointed out that the Government provided a water supply for certain districts at the request of the people concerned, and on the understanding that each district should bear the cost of its own particular scheme. If the Government could see their way to nationalise the whole of the water schemes it would be a different matter.

Mr. Greig (Port Pirie) said a good supply of water was needed to grow lucerne. The question as to which was the best, a petrol or an oil engine, was a very debatable one. The matter had been discussed at a meeting of the Port Pirie Branch, and a substantial majority favored the petrol engine for all farming purposes, pumping included. In his opinion it was a decided mistake to use sprinklers for irrigation purposes when the quality of the water was not up to standard. Many plants suffered if mineralised water was thrown on their foliage. He thought if there was any doubt as to the quality of the water, those proposing to use sprinklers should, before doing so have the water analysed. He intended having that done, but when he found it would cost him £3 or £4 it was a different matter.

Mr. G. G. Nicholls pointed out that the Director of Agriculture was prepared to have samples of water sent in by producers analysed free of cost. That was, of course, providing the reasons given for desiring the analysis were deemed satisfactory.

Mr. S. O. Smith (Angaston) said he had used sprinklers for watering lucerne day and night in hot weather. By the use of sprinklers the water could be better distributed than was the case with trenches. There was no doubt windmills were the cheapest means of pumping water.

The motion was put to the meeting as follows:—"That the Advisory Board be requested to bring under the notice of the Government the difference in the prices charged for water from the Beetaloo and Bundaleer reservoirs and from the Barossa and Happy Valley schemes, and to ask the Government to adjust the difference."

The resolution was declared lost by a substantial majority.

THE EVENING SESSION.

The Congress was continued in the evening, when a large number of delegates and visitors attended. The Chairman of the Advisory Board (Mr G. R. Laffer) presided.

THE SHEEP-CARRYING CAPACITY OF A LOWER NORTH FARM: A RECORD OF SEVEN YEARS' WORK.

Professor A. J. Perkins (Principal Roseworthy Agricultural College) read the following paper on "The Sheep-carrying Capacity of a Lower North Farm: A Record of Seven Years' Work":—

INTRODUCTORY.

In 1907 and 1908 I published data relating to the number of sheep we had carried during those two years on the Roseworthy Agricultural College Farm. I could not pretend, however, that the figures given at the time were sufficiently far-reaching to give them anything like the value of fair averages. Since then I have set myself the task of attaining this object, and to-day, with the record of seven years' work before me, I feel justified in claiming that the figures that I propose giving you correspond very fairly to our general average conditions. During these seven years a careful record of the individual sheep-carrying capacity of each field has been kept; this involves an amount of tedious work that only those who have had to carry it out can appreciate; and I wish, in this connection, to express my indebtedness to Mr. J. P. Richardson, late Farm Manager of the College Farm, for the conscientious and painstaking manner in which he has kept these records for a period of seven years. I am also indebted to Mr. A. J. Adams, M.A., for checking the numerous calculations which form the foundation of this paper.

DEFINITION OF THE LOCALITY.

It will be noticed that I have called our records the records of a Lower North farm; strictly speaking, however, from the point of view of the statistician, we do not belong to the Lower North. I incline, nevertheless, to the opinion that our conditions, both of soil and climate, approximate very closely to the average conditions of the Lower North. We are not a particularly favored locality, nor, on the other hand, are we a particularly disinherited one; and I feel justified in believing that what can be done by us in the way of live stock carrying can be equalled, if not improved upon, over the bulk of the Lower North. Portion of our land is characteristic limestone mallee land, typical of Yorke's Peninsula; portion of it is heavier in character and represented by Murray box and peppermint flats; native pine sand ridges run through part of the farm, and to a limited extent some of the fields are of recent lacustrine formation. On the whole, under natural conditions, this land can never have had a very high sheep-carrying capacity. I hope to show that cropping and tillage generally has done much towards improving it in this direction.

THE SEVEN SEASONS.

The value of pasture, and its sheep-carrying capacity, is so dependent on the rainfall and its general distribution throughout the year, that I deem it essential to indicate at the outset details concerning it in Table I.

TABLE I.—*Showing* 1906-12 *Rainfall Comparatively with the Means of* 30 *Years*—1883-1912.

								Means.	
	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1906-12.	1883-1912.
January	—	0·05	0·48	0·75	1·72	—	0·09	0·30	0·86
February	0·08	0·33	0·43	0·28	—	2·13	0·21	0·49	0·50
March	2·64	0·17	1·09	1·17	4·43	0·66	0·70	1·55	0·88
April	0·45	2·79	0·76	1·91	0·23	0·33	0·91	1·05	1·74
May	0·99	1·96	3·36	2·89	3·20	1·79	0·19	2·05	1·80
June	2·84	1·57	2·89	1·84	2·81	2·33	1·68	2·28	2·65
July	1·99	1·15	1·42	3·80	2·86	1·56	1·87	2·09	1·91
August	3·35	2·18	1·79	4·56	1·32	0·68	3·19	2·44	2·09
September	2·65	1·08	3·09	1·62	2·64	2·36	2·43	2·25	1·79
October	1·77	1·22	2·15	2·55	2·55	0·37	0·94	1·65	1·60
November	2·26	1·86	0·07	2·08	1·18	0·04	1·84	1·33	1·04
December	0·70	0·62	0·21	0·70	0·93	1·44	0·92	0·79	0·87
Total	19·72	15·05	17·74	23·05	23·87	13·69	14·97	18·29	17·66

We may note that this period of seven years included three years in which the rainfall was above the average—1906, 1909, and 1910; one season in which it was about normal—1908; and three seasons in which it was below the average—1907, 1911, and 1912. The average rainfall for the seven years —1906-12—was slightly above the recorded average of thirty years—1883-1912. On the whole, therefore, in so far as our records go, this period of seven years may be taken to be fairly representative of our normal average conditions.

AVERAGE NUMBER OF SHEEP CARRIED BY THE ROSEWORTHY AGRICULTURAL COLLEGE FARM DURING 1906-1912.

We may now consider the number of sheep that were carried by the College Farm over this period. These are indicated below, month by month, in Table II.

Table II.—*Showing Number of Sheep carried by the Roseworthy Agricultural College Farm between* 1906-7 *and* 1912-13.

Months	1906 7	1907 8	1908 9.	1909 10	1910 11	1911-12	1912 13	Means
April	865	1,181	1,253	1,282	1,108	1,197	1,081	1,138
May	824	1,148	1,328	1,425	1,218	1,383	1,258	1,226
June	1,211	1,603	1,551	1,662	1,516	1,722	1,392	1,522
July	1 173	1,629	1,763	1,735	1,712	1,899	1,460	1,624
August	1,158	1,610	1,774	1,644	1,713	1,870	1,530	1,614
September	1,154	1,613	1,790	1,553	1,679	1,728	1,518	1,577
October	1,111	1 370	1,638	1,513	1,466	1,519	1,419	1,434
November	1,616	1,261	1,458	1,459	1,236	1,326	1,231	1,370
December	1,635	1,239	1,359	1,374	1 183	1,218	1,089	1,300
January	1,550	1,225	1,299	1,249	1 172	1,138	1,041	1,239
February	1,464	1,254	1,289	1,172	1 182	1,073	1,027	1,209
March	1,374	1,256	1,297	1,141	1 197	1,047	1,000	1,187
The season	1,261	1 366	1 483	1,434	1 365	1,427	1,254	1,370

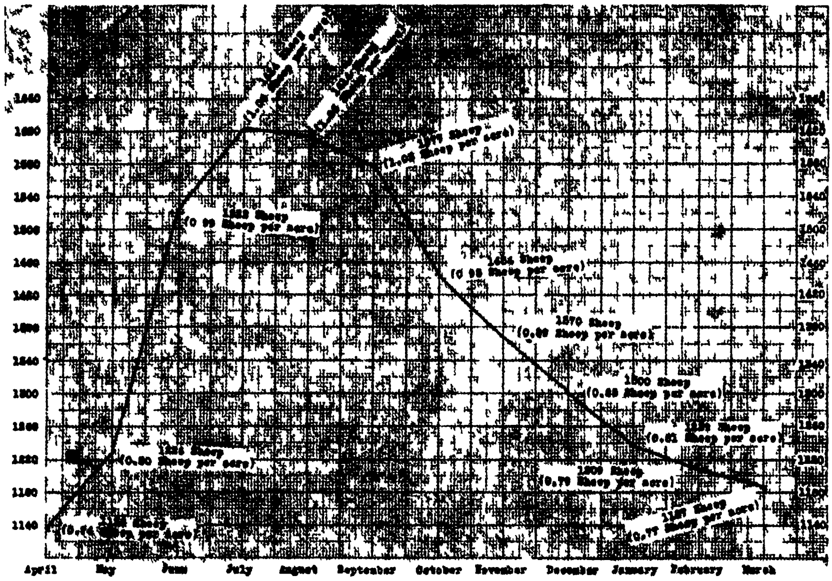


Fig 1 Illustrating Table II and showing the Average Number of Sheep carried month by month on the College Farm, (1906-1913) together with their relation (Sheep per acre) to the total farm arable and grazing area.

In Fig 1 is given a graphic illustration of the last column in Table II, in which is indicated the mean number of sheep carried by the College Farm in each month of the year between 1906 and 1913 It will be noted how the curve starts low in April, before the ewes have lambed , how it rises slightly in May, with the tailing of the Merino lambs , how it rushes up in June, when the bulk of the cross-bred lambs are tailed , how it reaches a maximum in July, with the tailing of the late-dropped lambs , how it remains stationary in

August, except for occasional deaths or sales; begins to fall in September, with the first sales of fat lambs; and subsequently continues to fall evenly through the balance of the season as fat lambs are sold, or aged ewes culled.

We may note, too, that between 1906 and 1913 the average number of sheep grazed on the College Farm throughout the year was represented by 1.370.

THE CHARACTER OF THE FLOCK.

I suppose that at this stage it is more or less essential that I should say something on the general character of the flock we have kept. I have already referred to fat lambs; and whilst, perhaps, in a sense they represent the business part of our flock, I cannot for an instant pretend that our flock has been a typical fat lamb flock; very far from it. I am quite prepared to admit that our flock would prove more profitable if we were to confine ourselves to the rearing of fat lambs; but, in an educational institution, there are other things to think of besides the profit and loss of field operations. And it is these other things that have led to the building up on the College Farm of a very heterogeneous flock. In the first place, under our conditions, I am firmly convinced that we cannot improve upon the cross-bred ewe as a mother for fat lambs: but which type of cross-bred ewe is best? This, no doubt, is a question the solution of which must vary with localities; it had not been solved for us, and within recent years we have tested on the College Farm half-bred Leicesters, half-bred Romney Marshes, half-bred Dorset Horns, half-bred Shropshires, and half-bred Southdowns. It will be realised, therefore, that our flock of cross-bred ewes has been a very mixed one. But, in addition to rearing fat lambs from cross-bred ewes, we have always bred the ewes themselves. This has meant the presence on the farm of a flock of pure-bred Merino sheep; and, further, with few exceptions, we have always bred our own Merino ewes; and, more, we have also bred our own Merino rams. Finally, since I have always been of the opinion that the best possible sire for fat lambs of cross-bred ewes is the Southdown ram, and good Southdowns are not easily obtainable in South Australia, we have kept a small stud flock of pure Southdown sheep, from which we have bred all the rams we have required.

I am not holding up our flock as an example worthy of being followed by farmers generally; I merely wish to point out that the circumstances of an educational institution will always tend to lower the profit-earning power of any flock that may be kept.

OTHER FORMS OF LIVE STOCK DEPASTURED.

In Table II. I have indicated the number of sheep grazing on the College Farm. It must not be overlooked, however, that sheep are not the only form of livestock that have access to our pastures. We keep a dairy herd, milking according to circumstances from 25 to 30 cows; and since we rear our own cows the farm always carries a varying number of young heifers and calves. Our working horses, too, from time to time find their way into the grazing fields; and, additionally, since we rear draught horses, grazing fields are open to the colts and fillies as much as circumstances permit of. The extent to which these large stock—cattle and horses—are depastured, and not hand fed, depends of course much on circumstances; and although, as we shall see later on, grazing as distinct from hand-feeding is easily traceable where individual fields are concerned, it is not so easily estimated in the aggregate. In this connection, therefore, I shall have to content myself with a statement of the number of horses and cattle present on the farm in September of each year, and the additional remark that these larger form of live stock—each head of which has an average grazing equivalent of five sheep—have occasional access to our grazing areas.* These data are summarised below in Table III.

TABLE III.—*Showing Number of Horses and Cattle Present on the College Farm in September of Each Year,* 1906-12, *together with their Calculated Grazing Equivalent as Sheep.*

	1906.	1907.	1908.	1909.	1910.	1911.	1912.	Means.	Grazing Equivalent as Sheep.
Horses	35	50	54	55	63	70	76	58	290
Cattle	74	69	59	68	72	64	52	65	325
									615

I make no reference to pigs, since for grazing purposes the latter have access to only a very limited area of the farm fields.

GENERAL DISTRIBUTION OF THE FARM AREA.

Before determining the grazing area that has through this period of seven years been open to our flock, it will be as well to consider what has been the general distribution of the arable farm land over the same period. It should be stated here that the general farm area has between 1906 and 1913 been extended by two successive purchases of adjoining fields that came into the market. In Table IV. I have indicated the general distribution of our farm area between 1906 and 1913. No account has been taken in this table of roads, plantations, buildings, &c., which cannot be taken as available for grazing purposes.

TABLE IV.—*Showing General Distribution of Farm Arable and Grazing Area*— 1906–13.

	1906-7. Acres.	1907-8. Acres.	1908-9. Acres.	1909-10. Acres.	1910-11. Acres.	1911-12. Acres.	1912-13. Acres.	Means. Acres.
Rape	51·5	44·4	38·0	36·5	20·0	23·0	—	—
Kale	20·0	30·3	—	23·0	3·5	4·7	—	—
Crimson clover	22·3	—	—	—	—	—	—	—
Maize	4·7	—	—	—	10·0	—	—	—
Sorghum	—	20·0	22·3	37·5	22·3	36·8	19·2	—
Turnips	—	6·5	23·7	—	—	—	—	—
Peas	—	—	23·0	20·0	—	—	22·3	—
White mustard	—	—	15·5	—	—	—	—	—
Sown grasses	—	—	12·0	32·0	32·0	32·0	12·0	—
Lucerne	—	—	—	—	85·0	119·0	119·0	—
Total grazing crops	98·5	101·2	134·5	149·0	172·8	215·5	172·5	149·1
Ordinary Pasture	272·0	393·5	262·2	429·4	299·5	281·5	247·5	312·2
Total area available for grazing	370·5	494·7	396·7	578·4	472·3	497·0	420·0	461·3
Under crop (mostly cereals)	634·0	447·4	542·6	620·4	611·4	611·8	726·0	599·1
Bare fallow	380·7	443·1	445·9	411·9	526·0	500·2	609·0	473·8
Total arable and grazeable area	1,385·2	1,385·2	1,385·2	1,610·7	1,609·7	1,609·0	1,755·0	1,534·2

Thus, then, between 1906 and 1913 the average extent of the arable and grazing farm area has been 1,534·2 acres; during the same period the average area under crop in each year has been 599·1 acres, the average area under grazing crops has been 149·1 acres, the average area of fields lying out (ordinary pasture) has been 312·2 acres, and the average area treated as bare fallow has been 473·8 acres.

RELATION OF NUMBER OF SHEEP KEPT TO TOTAL ARABLE AND GRAZING AREA OF THE COLLEGE FARM.

A reference to Table II. will show that between 1906 and 1913 the College Farm carried a yearly average of 1,370 sheep. If we connect this number with the average arable and grazing area of the farm over the same period, we shall see that this represents 0·89 sheep to the acre, or close on nine-tenths of a sheep for the whole area throughout the year. If, further, we bear in mind that, in addition to sheep, both cattle and horses have had access to the same grazing area, we shall not be far out in the statement that a farm 1,534·2 acres in area, in which 1,072·9 acres have been under cereals or treated as bare fallow—over 70 per cent. of the total area—has carried between 1906 and 1913 an average of one sheep to the acre.

The average grazing area available over the same period is shown to be 461·3 acres in Table IV.; and this works out to 2·97 sheep to the acre. This figure, however, as we shall have occasion to see, is misleading: it does not take into account the grazing value of the stubbles, nor of the fallowed fields before they are broken up, nor of the bare fallow itself.

A reference to Fig. 1 will show how the average relation of sheep kept to the total arable and grazing area of the farm has varied from month to month.

HAND-FEEDING.

The question will immediately be raised as to the extent to which, under the conditions indicated, sheep will need, independently of grazing crops raised, to be hand-fed. I may say that I have never taken the view that in the absence of natural feed the flock must be allowed to starve; and we all know that at such times, except at considerable sacrifice, it cannot, as a rule, be sold; hence the only alternative is artificial feeding until grass shall have become available. I may say that in our district in years in which April and May rains are abundant, no hand-feeding at all is necessary. Such was our experience in 1907-8, 1909-10, and 1910-11. Seasons 1906-7, 1908-9, and 1911-12 were not on the whole quite as favorable to grazing; and during the months of April and May our various flocks were kept going with the residues of the preceding harvests, represented for the most part by cocky chaff and cavings or broken straw—to the latter a certain amount of molasses was usually added. This, however, represents very moderate hand-feeding, and in ordinary circumstances is all that is as a rule needed. Our period of seven years, however, includes 1912-13: a season, I think, in which we had a very good example of how far hand-feeding must needs go in extreme cases, and I regret to think that this example bids fair to be bettered in the present season. In the circumstances it will be interesting to indicate in detail what was actually fed out to sheep, with its actual cost. These details are shown below in Table V.

TABLE V.—*Showing Amount and Value of Foodstuffs Fed Out to Sheep in* 1912–13.

	Bran	Crushed Corn.	Pollard.	Hay Chaff.			Straw Chaff.			Baled Straw.	Molasses
	Bush.	Lbs.	Bush.	T.	C.	L.	T.	C.	L.	Cwts.	Cwts.
April..........	—	—	—	0	16	86		—		15	—
May	633	3,380	—	0	10	0	0	6	0	—	5
June	1,059	—	—		—		9	1	0	—	—
July	630	1,656	24	2	4	0	9	19	0	—	—
August	336	438	—	0	15	0	0	9	0	—	—
September ...	—	76	—		—			—		—	—
November ...	6	—	—	0	1	0		—		—	—
December	12	—	—	0	2	0		—		—	—
January	12	—	—	1	0	0		—		—	—
February	42	—	—	4	7	36		—		—	—
March.........	36	—	—	2	1	0		—		—	—
Totals......	2,766	5,550	24	11	17	10	19	15	0	15	5
Values	£184/8/-	£11/11/3	£1/15/-	£29/12/8			£49/7/6			£1/6/-	£1/-/-

Total value of foodstuffs.................. £279/0/5

Thus, then, in a season exceptionally unfavorable to grazing, we were compelled to supply our sheep with hand-fed foodstuffs to the value of £279 0s. 5d. The average number of sheep carried by us throughout that season amounted to 1,254. If the cost of the hand-fed foodstuffs be distributed over this number of sheep it works out to 4s. 5d. a head, a sum which is by no means crippling even in a bad season. In the same season the gross receipts from the flock were represented by £960 13s. 4d., or 15s. 4d. per head of sheep kept; and after deduction of the cost of hand-feeding there is ample margin for ordinary expenses coupled with a reasonable profit.

ON THE CLASS OF PASTURE OPEN TO SHEEP ON THE AVERAGE LOWER NORTH FARM.

I shall now proceed to examine in detail the carrying capacity of the various forms of pasturage open to sheep on Lower North farms. The pasturage usually available may be classified under the following headings :—

1. Ordinary pasture, or fields temporarily out of cultivation.
2. Stubble pasture.
3. Bare fallow grazing.
4. The feeding-off of crops.
5. Grazing forage crops.

ORDINARY PASTURE.

I have called ordinary pasture the kind of pasture offered by plants growing spontaneously in fields temporarily left out of cultivation, and pasture of exceptional value it has proved since the general use of phosphatic manures for wheat. In Table IV. I have shown the mean area under ordinary pasture to have been represented by 312·2 acres over our period of seven years. I have also stated that this figure is misleading since it takes into account only those fields which happen to have been left out of cultivation for the season. In addition to these fields there are also the fields which are being fallowed in the same season, and which for portion of the year, at all events, are available for grazing purposes. To what extent this is the case will be seen below in Table VI., in which are indicated the areas of ordinary pasture available in each month of the year over the whole period of seven years, together with the general means.

Table VI.—*Showing Areas Available as Ordinary Pasture in Each Month of the Year between* 1906 *and* 1913.

	1906-7. Acres.	1907-8. Acres.	1908-9. Acres.	1909-10. Acres.	1910-11. Acres.	1911-12. Acres.	1912-13. Acres.	Means. Acres.
April......	652·7	836·6	723·6	913·8	892·8	853·9	851·0	817·8
May	652·7	836·6	723·6	913·8	892·8	853·9	851·0	817·8
June	641·2	832·3	719·1	895·5	892·7	836·3	827·9	806·4
July	519·4	726·9	594·3	758·7	733·3	666·3	614·0	659·0
August ...	404·6	601·3	487·1	680·5	591·3	507·8	439·1	530·2
September	306·6	499·1	379·6	547·0	524·5	381·6	294·5	419·0
October ...	272·0	411·6	285·4	456·3	458·3	306·7	247·5	348·3
November .	272·0	393·5	262·2	429·4	419·5	291·7	247·5	330·8
December .	272·0	393·5	262·2	429·4	419·5	281·8	247·5	329·4
January ..	272·0	393·5	262·2	429·4	419·5	281·5	247·5	329·4
February .	272·0	393·5	262·2	429·4	368·5	281·5	247·5	322·1
March.....	272·0	393·5	262·2	429·4	334·5	281·5	247·5	317·2
Yearly means	400·8	559·3	435·3	609·4	578·9	485·4	446·9	502·3

From Table VI. it will be seen that the average area available as ordinary pasture instead of being 312·2 acres was over the seven-yeaŧ period 502·3 acres. I have given the last column of this table graphic illustration in Fig. 2. The fall of the curve illustrates graphically the gradual reduction of the area available for ordinary pasture as the season advances. In April and May—the seeding months—the ordinary pasture is at its maximum. In June, in which late seeding operations are still in hand, the reduction of the area, as a result of early fallowing operations, is only slight. In July,

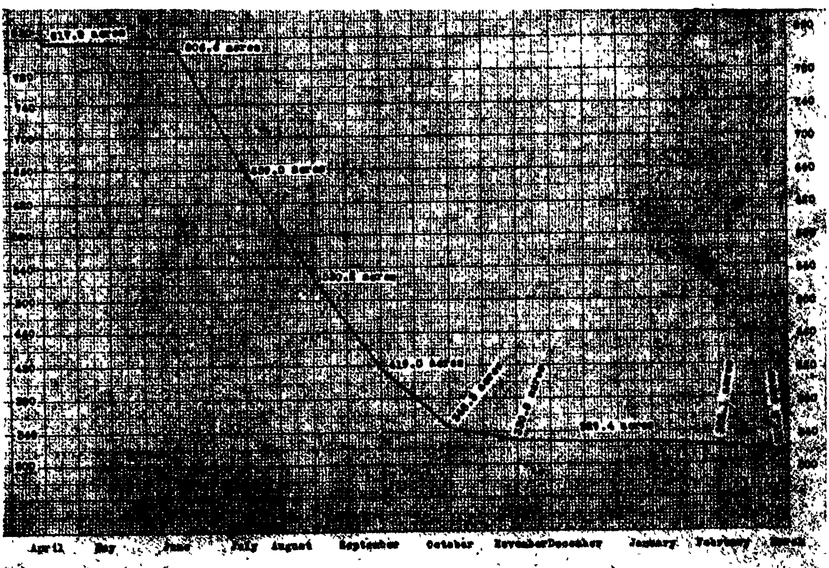


Fig 2. Showing gradual decline of Available Ordinary Pasture area with the progress of Fallowing Operations 1906-13.

when fallowing operations are in full swing, the decline is very rapid, and equally pronounced in August and September. In October late fallowing continues, and there is a further reduction in the area available for grazing, but less pronounced than was the case in the preceding three months. From November to March the area available for grazing purposes remains practically stationary, with the exception of limited areas that may occasionally be broken up towards the end of the season should heavy thunderstorms prepare the way.

THE SHEEP-CARRYING CAPACITY OF ORDINARY PASTURE.

We may now proceed to examine what our records show to have been the average sheep-carrying capacity of ordinary pasture over this period of seven years. There are two observations that I wish first to make in this connection. In giving the sheep-carrying capacity of ordinary pasture for any given year, all fields of which we have accurate records are taken into consideration ; in almost every year, however, a few fields are not taken into our calculations, either because the records concerning them were not accurately kept, or because for various reasons it was not possible to keep them. Secondly, in the figures given herewith, *livestock that were not artificially fed* only are taken into account ; for the most part they consisted of sheep ; occasionally, however, cattle or horses were recorded as grazing with them ; in the latter case, the larger heads of livestock have been reckoned in my tables as being equivalent to five sheep, which is, if anything, below their grazing value. These remarks that have been made for ordinary pasture apply equally to all other forms of grazing, with which we shall have to deal in the sequel, and will not, therefore, be repeated.

Details concerning the sheep-carrying capacity of ordinary pasture from month to month over the period extending between 1906 and 1913 are shown below in Table VII.

TABLE VII.—*Showing Sheep-Carrying Capacity, Month by Month, on Ordinary Pasture at the Roseworthy Agricultural College Farm*, 1906-13.

	1906-7.	1907-8.	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.	Means.
	Sheep per Acre.							
April......	0·50	1·12	0·03	1·60	1·11	1·40	Nil	0·82
May	0·91	1·39	0·77	1·78	1·30	1·38	Nil	1·08
June	1·50	1·40	1·56	1·78	1·84	1·90	Nil	1·43
July	1·30	1·80	2·41	1·97	2·29	2·42	0·02	1·74
August ...	2·23	2·55	2·76	2·65	2·15	2·24	2·43	2·43
September	1·45	2·00	3·48	2·58	1·83	3·36	3·85	2·65
October ...	0·22	2·55	3·25	1·25	1·74	1·85	3·70	2·08
November .	1·72	2·35	3·57	0·99	1·38	2·95	1·34	2·04
December .	4·33	1·13	2·80	1·70	1·18	1·59	1·12	1·98
January ..	4·16	0·57	1·58	1·12	1·08	0·04	0·93	1·35
February .	1·44	0·90	1·20	0·23	0·65	0·06	0·41	0·70
March.....	0·99	1·24	1·51	0·42	1·52	0·43	0·41	0·93
12 Months .	1·55	1·58	1·86	1·61	1·58	1·72	0·71	1·51

Table VII. shows the average sheep-carrying capacity of ordinary pasture to have been represented by a little over one and a half sheep to the acre over a period of seven years (1906-13). It will be noted that 1912-13 is the only season in which it was below a sheep to the acre; and this is accounted for by the fact that in the opening four months of the season the carrying capacity of ordinary pasture was practically nil.

I have given graphic illustration to the last column in Table VII., in Fig. 3; the curve shows how the carrying capacity opens low, gradually ascending with every succeeding month until a maximum is attained in September; thereafter, in October and November, there is a slight decline in the carrying capacity of the fields; a decline which is far more marked towards the end of the season, when, fortunately for the farmer, the cereal stubbles become available for grazing purposes.

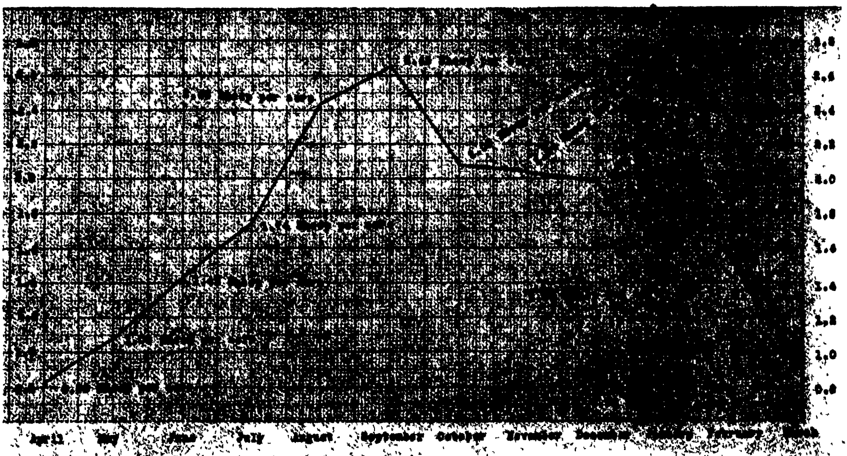


Fig. 3. Showing Average Number of Sheep to the acre carried by Ordinary Pasture on the College Farm 1906-1913.

STUBBLE-GRAZING.

In the summer months, so soon as the hay has been stacked and the corn garnered, the stubble fields offer valuable grazing to the farmer who owns sheep; and it frequently happens—when earlier circumstances have led to the heavy stocking of other fields—that access to these fields is anxiously awaited. The character and value of the feed available must vary according as the crops have been cut for hay, or harvested at maturity with the complete harvester, or merely stripped. It may perhaps be thought that hayfields can offer but little that is of value to a flock of sheep; experience shows, however, that is very far from being the case. The figures that I shall have occasion to quote—the results of our own experience—refer almost exclusively to fields in which the crop has been cut down with the binder. We make but little use of either stripper or complete harvester; we bind our grain crops and thresh them out at leisure; for us straw is too valuable an asset to be burnt or trod under foot. It will be quite evident, therefore, that the average farmer's harvester-reaped stubbles will be infinitely superior as grazing grounds to our own; the scattered grain, the chaff, the straw, will represent so much feeding material in which the College stubbles are lacking, or which they hold only to a very limited degree. These facts, notwithstanding, we have always, as I shall have occasion to show, found our stubble-fields grazing grounds of exceptional value.

There is an indirect benefit which attaches to the consistent grazing of stubbles which cannot be too strongly insisted upon; I refer to the ready mastery which it gives the farmer over "stinkwort" (*Inula graveolens*). I think I can say, without offensive boastfulness, that in the matter of stinkwort, the College fields are in marked contrast with those of most of our neighbours; and this I attribute exclusively to the fact that every year we graze our stubbles heavily and consistently with sheep as early in the season as possible. For the purpose it is of very little use waiting until March to turn the sheep into the stubbles; they must have access to them whilst the weed is still in the early stages of its growth; young plants sheep will eat out completely; of older ones they will no more than nibble off the growing extremities. If a field is known to be badly infested with stinkwort it should be heavily stocked with sheep as soon as it is clear of the harvest workers; it is the only method that I know of that will effectively keep the pest in check.

The figures given below in Table VIII. give the sheep-carrying capacity of stubble-fields—not for a whole year, but for a period extending from December to March, inclusively (122 days)—during which the stubbles may be said to be available for grazing purposes.

TABLE VIII.—*Showing the Sheep-Carrying Capacity of Stubble-Fields from December to March, inclusively* (122 *Days*), 1906-13.

Season.	Sheep per Acre. (Dec.-March).
1906-7	1·53
1907-8	2·88
1908-9	1·11
1909-10	1·26
1910-11	1·60
1911-12	1·66
1912-13	0·86
Mean 1906-13	1·55

Thus, then, over a period of seven years, our stubbles have carried an average of a little over one and a half sheep to the acre from December to March, inclusively.

FALLOW-GRAZING.

Fallow-grazing fills a double purpose on the farm; on the one hand it serves to clean the fallows, both effectively and expeditiously, and on the other it supplies new grazing grounds at a time of the year when the ordinary pasture area is fast tending towards its minimum. I am aware that the practice is not in the best interests of the general quality of the fleeces; but the slight depreciation in the wool that it unavoidably brings with it cannot possibly outweigh its great advantages to the farmer. Moreover, the grazing of sown and cultivated forage crops is open to very much the same sort of objection; and I do not suppose that anybody is seriously prepared to maintain that the farmer should refrain from taking advantage of them. The fact is that the farmer's wool must always continue to be described as "shabby," relatively to that of the stationowner, whose sheep graze over cleaner and firmer pastures. On the other hand, on the farm the carcass is the chief consideration, and wool only secondary; whilst the reverse is the case on station property.

The extent to which farm fallows offer grazing facilities depends much on the nature of the season, and the effectiveness with which the fallows have been tilled. I indicate below, in Table IX., what has been our experience in this direction between 1906 and 1913.

TABLE IX.—*Showing the Grazing Capacity of the College Farm Fallows, 1906-13.*

	1906-7.	1907-8.	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.	Means.
	Sheep per Acre.							
April......	0·14	—	—	—	—	—	0·19	0·05
May	0·16	—	—	0·57	—	—	0·04	0·11
June	—	—	—	0·14	—	—	—	0·02
July	—	—	—	—	—	—	—	—
August ...	—	—	—	—	—	0·08	0·07	0·02
September	0·07	0·78	0·80	0·21	1·14	0·44	0·25	0·53
October ...	1·72	0·10	0·21	0·60	3·01	0·65	0 64	0·99
November	2·57	0·02	0·04	1·17	1·97	0·01	0·57	0·91
December .	0·27	0·01	0·31	0·53	—	—	0·14	0·18
January ..	—	0·18	0·09	0·08	0·23	—	0·03	0·09
February .	—	—	0·04	0·16	0·44	—	—	0·09
March.....	—	—	—	—	0·19	—	0·06	0·04
Sep-.Dec. (122 days)	1·16	0·23	0·34	0·63	1·53	0·29	0·42	0·66
Jan.-March (90 days)	—	0·06	0·04	0·08	0·28	—	0·03	0·07
April-May (61 days)	0·15	—	—	0·36	—	—	0·11	0·09

It will be noted that the normal grazing time for bare fallows extends from September to December, inclusively; for that period of 122 days the College

Farm fallows averaged about two-thirds of a sheep to the acre between 1906 and 1913. The grazing available in the January-March period is on the whole insignificant, being represented by 0·07 sheep per acre for the period under consideration. The grazing which may take place before seeding operations, under favor of early rains, is also equally insignificant, being represented by 0·09 of a sheep per acre.

THE FEEDING-OFF OF CEREAL CROPS.

I shall have but little to say to-day on the feeding-off of cereal crops with sheep. Quite recently, in conjunction with Mr. Spafford, I had occasion to publish a long report embodying our general conclusions, based on some experimental work we had carried out on the subject. I shall, therefore, content myself with remarking here that in my view, the feeding off of cereal crops with sheep must always remain on any farm of more or less accidental occurrence. It must be evident that these crops have not been put in for the special benefit of the flock; and, if they are fed off at all, it is only when they stand manifestly in need of it and appear likely to benefit in yield by the treatment. And this can be the case only in exceptional circumstances and seasons; when the crops have been sown early in years of abundant April rains; when seeding has been too thick, or too thin; when the land is in too high condition, and growth correspondingly rank, &c. All these are more or less exceptional cases; and adequately to meet them it is always of advantage to have a flock handy. It is then the function of the sheep to save or improve the crop; but I cannot agree with those who argue, knowingly or unknowingly, that the crops are there to save the flock.

GRAZING FORAGE CROPS.

Finally, on any farm on which sheep are kept, portion of the farm area should always be sown to suitable kinds of forage crops that can be grazed. These crops will naturally vary with circumstances and districts; I must, however, confine my remarks to those crops that were tested on the College Farm over our period of seven years. These include rape, kale, crimson clover, maize, sorghum, turnips, peas, white mustard, sown grasses, and lucerne.

RAPE.

The great value of rape as a sheep forage crop, adapting itself well to our average conditions of climate, cannot be over-stated. During recent years we have made very free use of rape on the College Farm, and have found it, as a rule, invaluable between June and January. I have indicated below in Table X, what has proved the sheep-carrying capacity of this crop in each month of the period of seven years extending between 1906 and 1913.

TABLE X.—*Showing the Sheep-Carrying Capacity of Rape on the College Farm, Month by Month, between* 1906 *and* 1913.

	1906-7.	1907-8.	1909-10.	1910-11.	1911-12.	Means.
	Sheep per Acre.					
April	Nil	Nil	Nil	Nil	Nil	—
May	Nil	0·54	Nil	Nil	Nil	0·11
June	2·22	2·25	2·57	Nil	Nil	1·41
July	2·83	1·46	Nil	Nil	Nil	0·86
August	3·51	3·11	Nil	7·30	1·29	3·04
September	5·80	2·63	6·49	0·97	2·62	3·70
October	5·29	3·78	0·84	5·81	1·41	3·43
November	2·17	1·65	Nil	5·43	2·24	2·30
December	2·47	0·89	2·46	10·89	1·25	3·59
January	2·06	Nil	0·52	10·44	Nil	2·60
February	Nil	Nil	0·10	Nil	Nil	0·02
March	Nil	1·78	0·29	1·73	1·75	1·11
The 12 months	2·22	1·51	1·10	3·60	0·88	1·86
June-January period (eight months)						2·79

We see, then, that the grazing value of rape, grown mainly as a catch crop and on very slight tillage, was represented for the whole 12 months by a sheep-carrying capacity of 1·86 sheep to the acre; or, if we take the eight months during which it is more or less available on the College Farm—June-January—a sheep-carrying capacity of a little over two and three-quarters sheep to the acre. It may be added that did other farming operations permit of more efficient tillage being given to rape it would undoubtedly show up to better advantage than appears to be the case in the average data of Table X.

KALE.

The variety of kale known as "Thousand-headed" is the variety that we have almost invariably made use of for sheep-feeding purposes. Data concerning the sheep-carrying capacity of this crop are shown below in Table XI.

TABLE XI.—*Showing the Sheep-Carrying Capacity of Thousand-Headed Kale on the College Farm, Month by Month*— 1906–1913.

	1906-7.	1907-8.	1908-9.	1909-10.	1910-11	Means
	Sheep per Acre.					
April	—	—	—	—	—	—
May	—	—	—	—	—	—
June	—	—	—	—	—	—
July	—	—	—	—	—	—
August	Nil	0·18	Nil	Nil	Nil	0·04
September	14·36	4·30	Nil	0·40	Nil	3·81
October	12·07	6·04	6·91	12·76	Nil	7·56
November	10·02	3·67	9·54	6·82	18·49	9·71
December	7·00	Nil	2·47	8·04	13·06	6·11
January	0·55	1·65	1·38	4·86	Nil	1·69
February	1·77	Nil	Nil	1·41	Nil	0·64
March	—	—	—	—	—	—
Twelve months	3·81	1·32	1·70	2·86	2·63	2·46
September-January period (five months)						5·87

Table XI. shows the sheep-carrying capacity of kale to have proved equivalent to about two and a half sheep to the acre for a period of 12 months ; or, if we reduce this to the period during which the crop was actually available to us—September–January—equivalent to 5·87 sheep to the acre for a period of five months.

I am, of course, aware that under special treatment kale may still be available for grazing purposes in the early autumn months of the following season, immediately after the first rains. As a rule, however, this practice has not proved particularly advantageous to us, and we generally look upon kale as a valuable forage crop supplying an abundance of succulent feed in the late spring and over the greater part of the summer.

TURNIPS.

We have never grown turnips for sheep to any very large extent, and this chiefly because under our conditions of climate it is possible to grow them to any advantage only when autumn sown. They grow very rapidly, but unfortunately run up to seed on the first approach of warm weather, with the result that they are very largely wasted unless rapidly fed down at a time of year when other feed is generally available in large quantities. There is no doubt that even autumn-sown turnips supply enormous quantities of sheep feed ; it is secured, however, at a cost which is generally in excess of the expenditure involved in the raising of other types of forage crops. Hence I adhere to the opinion that for our district turnips cannot have the value that attaches to them in those districts in which they are usually spring sown and autumn or winter fed.

Data bearing on the results secured by us within recent years are shown below in Table XII.

TABLE XII.—*Showing the Sheep-Carrying Capacity of Turnips on the College Farm, Month by Month* –1907–13.

	1907-8.	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.	Means.
	Sheep per Acre.						
April	—	—	—	—	—	—	—
May	—	—	—	—	—	—	—
June	—	—	—	—	—	—	—
July	—	—	—	—	—	—	—
August	0·55	Nil	Nil	Nil	Nil	7·94	1·42
September	12·43	0·36	12·24	Nil	Nil	5·62	5·11
October	14·15	10·58	28·90	Nil	23·04	7·74	14·07
November	Nil	6·33	Nil	24·66	Nil	Nil	5·17
December	Nil	4·75	Nil	13·17	Nil	2·58	3·42
January	—	—	—	—	—	—	—
February	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—
Twelve months	2·26	1·84	3·46	3·15	1·92	1·99	2·43
September-December period (122 days)							7·27

We find, therefore, that for a period of 12 months the sheep-carrying capacity of turnips averaged out at close on two and a half sheep to the acre; or, if we reduce these figures to the September-December period (122 days), to over seven and a quarter sheep to the acre. The value, therefore, of turnips as a forage crop cannot be denied, even when autumn sown. The area sown to turnips, however, should, under our conditions, be confined to what may prove useful towards the spelling of other grazing areas in the spring.

VETCHES.

No more than turnips have we grown vetches for grazing purposes to any great extent; their value in this direction, and also as nitrogen providers is, no doubt, great. The chief obstacle to the more extended use of vetches in ordinary farming operations appears to me, for the present at all events, to be the exorbitant price charged for seed. Our data on the grazing value of vetches are summarised below in Table XIII.

TABLE XIII.—*Showing the Sheep-Carrying Capacity of Vetches on the College Farm, Month by Month* -1908-12.

	Sheep per Acre.			
	1908-9.	1910-11.	1911-12.	Means.
April	—	—	—	—
May	—	—	—	—
June	—	—	—	—
July	—	—	—	—
August	—	—	—	—
September	10·95	Nil	18·04	9·66
October	10·95	Nil	6·55	5·83
November	Nil	24·66	Nil	8·22
December	Nil	9·87	Nil	3·29
January	—	—	—	—
February	—	—	—	—
March	—	—	—	—
Twelve months	1·83	2·88	2·05	2·25
September-December period (122 days)				6·74

In the limited tests to which we put them vetches show a grazing value about equal to that of turnips. To their advantage, however, it may be said that whilst autumn-sown turnips must be fed off in the spring, a well-grown crop of vetches may be left untouched until required.

PEAS.

Peas have within recent years had a good deal of attention drawn to them. As a crop raised for seed, however, I do not anticipate that they are likely to make much progress in our midst; not, at all events, in our relatively drier districts. They present too many harvesting difficulties under dry conditions of climate to make of them a popular grain crop. For forage purposes, on the other hand, peas may be looked upon as invaluable in all soils that are light or, at all events, of not more than average consistency. Among the advantages that attach to this crop it may be mentioned that, like vetches, although not perhaps to an equal degree, they are nitrogen collectors, and as such they help to raise the natural fertility of the land on which they are grown. Another great advantage is the short growing period of peas, which for forage purposes makes it more or less immaterial whether they are early or late sown. Early seeding—April or May—results as a rule in heavy haulm growth and comparatively light podding; and this because the plants will come into bloom at a time when sharp frosts are still rife. Late seeding July or August according to districts—will give more abundant and better filled pods, but less luxuriant haulm growth. To the credit of early seeding it may be added that if the peas are fed off sufficiently early, and weather conditions are favorable, they will give rise to a very satisfactory grazing aftermath. As a crop that must fit in with our more important cereal crops, peas have often given me cause for reflection. In most countries both practice and theory agree that the pea crop should prepare the way for the wheat crop, and should therefore immediately precede it. Hence peas have come to be looked upon as a winter-grown fallow crop; and for the purpose they are admirable so long as the weeds that grow luxuriantly in their midst can be prevented from going to seed. There are only two ways of realising this object: early feeding-off of the crop, or having recourse to far more labor and tillage than we can well afford to do. If the crop is fed off early we lose the advantage of holding the pea crop over until other sources of feed are on the wane. I have come to the conclusion therefore and I recognise that others had come to it before me—that with us peas should not be treated as a fallow crop, but should be sown on a cereal stubble, broken up as well as circumstances permit of in the early autumn. In the circumstances it will matter little if the pea crop is dirty, and this will certainly be the case. It can be fed down at whatever time of the year is found most convenient for the purpose, and in the following year the land should be treated as bare fallow, during the course of which will take place the nitrification of the organic nitrogen left in the soil by the pea crop and grazing operations.

Our data on the grazing value of the pea crop are not very considerable, and for the most part refer to early grazing. The reason of this is that we have frequently cut down peas for hand-feeding purposes, whilst at other times we have converted the crop into ensilage, which is generally of excellent quality. Early grazing is due to the fact that hitherto we have looked upon a pea crop as a fallow crop. Our available data are summarised below in Table XIV.

TABLE XIV.—*Showing the Sheep-Carrying Capacity of Peas on the College Farm*—1908-12.

	1908-9.	1909-10.	1910-11.	1911-12.	Means.
	Sheep per Acre.				
April	—	—	—	—	—
May	—	—	—	—	—
June	—	—	—	—	—
July	—	—	—	—	—
August	—	—	—	—	—
September	1·35	Nil	Nil	22·91	6·07
October	6·05	Nil	Nil	Nil	1·51
November	7·06	15·02	24·96	Nil	11·76
December	1·25	14·24	5·79	Nil	5·32
January	Nil	11·02	Nil	Nil	2·76
February	Nil	0·35	Nil	Nil	0·09
March	Nil	2·42	Nil	Nil	0·61
Twelve months	1·31	3·61	2·54	1·88	2·34
September-March period (212 days)					4·03

The average grazing capacity of peas proved, therefore, equivalent to 2·34 sheep to the acre for 12 months; or to a little over four sheep to the acre for the seven months that they may be said to have been available —September-March.

LUCERNE.

In referring to the grazing capacity of lucerne, I do not, of course, refer to well-grown crops of this plant under irrigation, or sown in land in which the subterranean water table is within easy reach of the roots of lucerne. I have in view simply lucerne which has been sown in a cereal crop, and which has established itself more or less well in the field. In these circumstances its value for grazing purposes is very great; unfortunately, in our average districts it is no easy matter to get a good stand of lucerne sown in this way; much depends on the character of the season. In our experience one has quite two failures to one success in attempts of this kind. The improvement in the grazing value of the field is, however, very marked; and I am of the opinion, failures notwithstanding, that it is greatly to the advantage of those who keep sheep, to sow 5lbs. or 6lbs. of lucerne to the acre every year with portion of their cereal crops. If the stand of lucerne is good, the field may be left out of cultivation for a period of three years or thereabouts, and when it comes again under wheat it will be found to have gained very much in natural fertility.

Our own results, which are summarised below in Table XV., are perhaps on the whole misleading; they do not do full justice to the grazing capacity of lucerne sown in this way. And this, because only portion of the fields concerned were under lucerne; and it is not possible in our results to dissociate the grazing capacity of that part of the fields that were not under lucerne, from that which was under lucerne. Such as they are, these results are shown below in Table XV.

TABLE XV.—*Showing the Sheep-Carrying Capacity of Lucerne sown in a Hay Crop on the College Farm*, 1910-13.

	1910-11.	1911-12.	1912-13.	Means.
	Sheep per Acre.			
April	1·16	1·00	Nil	0·72
May	1·60	1·77	Nil	1·12
June	2·32	1·83	Nil	1·38
July	0·78	2·98	1·16	1·64
August	1·10	3·18	3·27	2·52
September	2·46	3·44	2·66	2·85
October	1·36	2·74	0·41	1·50
November	1·08	1·26	3·48	1·94
December	2·31	0·46	1·57	1·45
January	0·97	0·48	0·36	0·60
February	0·14	0·04	0·02	0·07
March	0·48	Nil	0·54	0·34
Twelve months	1·32	1·60	1·13	1·35

It will be noted that the average sheep-carrying capacity was only 1·35 sheep to the acre ; this is partly due to the fact that the period covered is only three years, included among which is the 1912-13 season, which was an exceptionally bad grazing year. I repeat that these figures do not do justice to the grazing value of a well-established stand of lucerne.

SOWN GRASSES.

I made the attempt to sow down to English grasses two of our fields ; these comprised perennial rye grass, cocksfoot, Kentucky blue grass, prairie grass, sulla, &c. The grazing capacity of these fields is shown below in Table XVI.

TABLE XVI.—*Showing Sheep-Carrying Capacity of Sown Grasses on the College Farm*, 1908-13.

	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.	Means.
	Sheep per Acre.					
April	Nil	Nil	0·32	1·33	Nil	0·33
May	Nil	0·29	0·14	1·24	Nil	0·33
June	Nil	1·52	3·39	2·05	Nil	1·39
July	0·32	2·73	0·69	3·91	Nil	1·53
August	2·23	0·44	2·72	4·71	Nil	2·02
September	3·82	2·48	7·17	3·79	0·86	3·62
October	5·02	5·16	5·76	6·12	3·13	5·04
November	1·80	2·71	1·44	0·95	5·17	2·41
December	Nil	3·94	Nil	1·21	Nil	1·03
January	Nil	2·14	Nil	1·08	Nil	0·64
February	Nil	Nil	Nil	0·77	Nil	0·14
March	Nil	0·13	Nil	Nil	Nil	0·03
Twelve months	1·10	1·81	1·80	2·27	0·76	1·55

It may be stated that a sheep-carrying capacity of little over one and a half sheep to the acre for the 12 months does not warrant under our conditions of climate the expense of sowing the land temporarily with expensive grass seed. The grazing value would have been equally good had the land been left out as ordinary pasture.

SORGHUM.

I have, unfortunately, no figures that can adequately picture the value of sorghum to the farmer who owns sheep in the Lower North; and this, in spite of the fact that there is not a year that passes in which we do not take advantage of this crop in some way or other. The position is that in the majority of cases we have looked upon sorghum as a crop more useful to our dairy herd than to sheep; and, with a view to preventing waste, we have generally cut the crop first and grazed-off the second growth. I may, however, be allowed to emphasize the value of sorghum to the owner of sheep. This crop makes summer growth, and, if needed for the purpose, may be fed down or cut in December or January. Its chief advantage, however, lies in the fact that it makes very good second growth, which may be left standing until lambing time, and in which the ewes may drop their lambs at a time of the year, when, apart from exceptional seasons, there is generally a scarcity of good natural feed. It is, of course, true that in most cases the adoption of this practice will lead to the loss of the field for cereals in that season; it can, however, still be sown to peas, and in some cases to barley.

WHAT, ON THESE DATA, IS THE SHEEP-CARRYING CAPACITY OF AN AVERAGE LOWER NORTH FARM?

We have up to the present moment been dealing with figures that represent so many solid facts; by way of concluding remarks, I wish, with your permission, to indulge in a little speculation. Taking the figures that we have been considering as a basis, what should be the average carrying capacity of a Lower North farm?

I propose taking as a standard a farm 900 acres in area, and wholly arable. I shall assume that in each season 300 acres will be put under wheat whilst another 300 acres will be treated as bare fallow. This would leave available for grazing purposes 300 acres, 50 acres of which I shall assume to be under forage crops, viz., 20 acres under rape, 20 acres under peas, and 10 acres under kale. It should be understood, however, that this arrangement is not necessarily one that I recommend; but merely one that I think to be feasible, and which can easily be modified according to local requirements and conditions.

In Table XVII., taking our own figures as a basis, I have calculated out what should be, month by month, the sheep-carrying capacity of a farm laid out on the lines indicated above. It will be noticed that the variations in the area available as ordinary pasture, according as fallowing operations progress, are indicated, month by month, in the first column of the table.

TABLE XVII.—*Showing the Calculated Sheep-Carrying Capacity of a 900-Acre Lower North Farm, Month by Month.*

	Ordinary Pasture.		Stubbles.	Fallows.	Rape.	Kale.	Peas.	Total.
	Area. Acres.	Sheep.	Sheep.	Sheep.	Sheep.	Sheep.	Sheep.	Sheep.
April.......	550	451	Nil	15	Nil	Nil	Nil	466
May	550	594	Nil	33	2	Nil	Nil	629
June	543	776	Nil	6	28	Nil	Nil	810
July	455	792	Nil	Nil	17	Nil	Nil	809
August	378	919	Nil	3	61	Nil	Nil	983
September .	311	824	Nil	127	74	38	121	1,184
October	268	557	Nil	279	69	76	30	1,011
November .	250	510	Nil	273	46	97	235	1,161
December ..	250	495	465	54	72	61	106	1,253
January ...	250	337	465	27	52	17	55	953
February ..	250	175	465	27	Nil	6	2	675
March......	250	232	465	12	23	Nil	12	744

Average sheep-carrying capacity of a 900-acre farm for 12 months 890

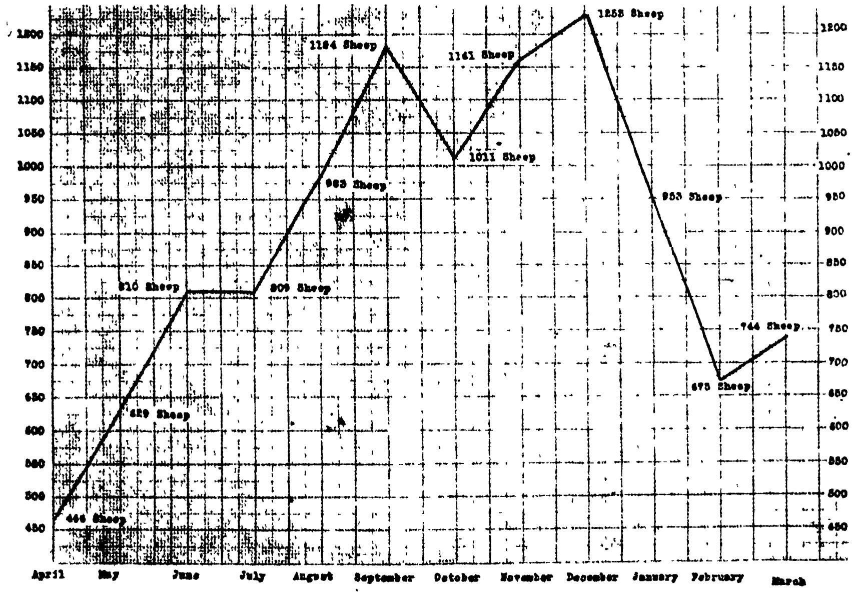


Fig 4 Showing the estimated Average Sheep Carrying Capacity of a 900-acre Lower North Farm, calculated from the 1904-1913 records of the Roseworthy Agricultural College Farm.

Thus, then, on a 900-acre farm, laid out on the lines indicated, we can in average seasons start with 466 sheep in early autumn; the carrying capacity of the farm gradually increases, month by month, until we reach a maximum in December, when the cereal stubbles are supposed to be available;

thereafter there is a gradual decline. The average carrying capacity of this farm is shown to be 890 sheep for the 12 months, *i.e.*, very close on a sheep to the acre for the whole area. It is as well to recollect that these are not merely theoretical figures, but figures based on the results of seven years' experience on the College Farm. It we suppose the farm in question to carry a fat lamb flock—and this, in my opinion, is the least speculative operation which a farmer can take up—if we assume this it can be stated that a 900-acre farm can, in average seasons, carry 450 lambing ewes.

If we examine the last column of the table closely we shall see that the gradually increasing carrying capacity of the available grazing area makes ample provision for the arrival and upkeep of the lambs over the months of May and June; that the carrying capacity of September, October, and November offers ample guarantee for their rapid growth and development; and that the latter months of the season, besides providing for the ewes, make provision for the fattening-off of those lambs that could not be sold as fat off their mothers.

These figures that are summarised in Table XVII. make reference, of course, to average seasons; and whilst in good seasons they will be found to be below the actual carrying capacity of the fields, in bad ones it is equally certain that the figures will be found to be too high. In this connection difficulties will arise mainly in the months of April, May, and June, *i.e.*, the months in which lambs are usually dropped. It is in these months that the number of sheep suggested for a 900-acre farm—450 ewes and their drop—comes nearest to the estimated average carrying capacity of the grazing area. The sheepowner has two alternatives to oppose to these opening difficulties of bad seasons; he may forestall them by having available for the purpose a good crop of sorghum in which his ewes may be turned out to lamb; or else he may concentrate his flock in the home paddocks and feed them on chaff, bran, or any other foodstuff that may be available. In ordinary circumstances these feeding operations are not likely to extend beyond six to eight weeks, and they may be reckoned not to cost more than a penny a head per day.

A Parting Word of Advice.

What I have now to say, by way of parting advice, will be more or less superfluous to those who have already kept sheep under farm conditions; to the unitiated, however, it may have some value. In the first place let me say that it should not be your object from the outset to endeavour to crowd on to your farm the greatest number of sheep possible; but rather that number which is likely to leave you the largest individual margin of profit. Maximum stocking can be undertaken with safety only by those whom long experience has taught how perilous a thing is overstocking. On any farm it should be an axiom that apart from diseased conditions, sheep should never be allowed to get below good store condition ; and when such is not the case, we must suspect overstocking, bad management, or, in very exceptional cases, a very very bad season. Beginners, I take it, must learn to walk before they attempt to run ; they should open up with a few ewes, increasing their number gradually, when they have learnt how to handle sheep to advantage under confined farm conditions, which, it may be added, differ radically from spacious statior conditions. In this connection sheep-proof fences are among the first things that should receive consideration ; and it will soon be found that the ordinary station six-wire fence is not sheep-proof on a farm ; it cannot be said to offer adequate protection to crops that are grown on the other side of it. Further, experience will then show that if a farm is to carry sheep at all in proportion to its area all abnormally large fields must disappear. On a farm on which sheep are kept I look upon 50 acres as quite a maximum in the way of area for all cultivated and grazed fields ; and the need of very many smaller fields will soon be felt it forage crops are to be grown and sheep are to be given those frequent changes of pasture which are so essential whenever they are kept under comparatively confined conditions. Personal experience has taught me that four 25-acre fields, over which the flock is frequently moved, will, in the course of a year, carry nearly twice as many sheep as a single 100-acre paddock, on which they are more or less stationary. Again, from the point of view of the early primeness of the lambs, it is never advisable to lamb much more than 100 ewes together ; nor should the flocks be larger until the lambs are strong and well grown ; this is manifestly an additional argument in favor of a large number of small fields over which the lambing flock may be distributed in the early autumn. A similar line of reasoning applies to the time of the year when the rams are turned out among the ewes ; if a large flock is turned out into an equally large field, the ewes are apt to stray away from the rams, and an irregular lambing and an unsatisfactory percentage are the usual consequences. I am quite aware that the multiplying of fields opens out difficulties in the way of providing them all with an adequate supply of water ; I cannot, however, allow myself to be lured away into a long discussion of this subject ; and I shall content myself with saying that in this, like in most things, where there is a will, there is a way ; but above all things, if you cannot see your way to supplying your flock freely with good clean water throughout the year, give up any thought of attempting to keep sheep on a farm for profit.

CONCLUSION.

I am afraid that I must show some respect for time and some consideration for the patience of the audience ; were it not so, I might find myself involved in the discussion of a hundred and one points, interesting in themselves no doubt, but on the whole foreign to the avowed subject matter of this paper.

It has occurred to me that it may be said that I have chosen a singularly unsuitable season for pointing out to others what I take to be the sheep-carrying capacity of a farm. I freely admit that if we have to go through many seasons such as the present one, the number of sheep which a farmer can keep on his farm to any advantage would be very limited, indeed South Australia has, however, been in occupation for a number of years sufficiently long to enable us to judge of its general agricultural capabilities ; and I am of the opinion that a season such as the present one, or the one that immediately preceded it, does not, in the minds of reasonable men, lower the value of our land one pennyworth. The crops that we have grown we shall grow again in the near future, and probably improve upon them ; the sheep that we have carried we shall continue to carry with equal success ; and the man who is afraid of the future had better make way for another and take up some less arduous, and perhaps less healthful, occupation.

THE DISCUSSION.

The Chairman said he knew very little about sheep, but he had been particularly impressed with some figures recently quoted by the Minister, which showed that the falling off in the number of sheep in the counties of Light and Gawler was, during the last 10 years, nearly 50 per cent. He thought that was to be regretted, because in no phase of agriculture were there greater possibilities of expansion than in the meat trade. The paper was open for discussion.

Mr. A. L. McEwin (Blyth) had listened to the reading of the paper with great interest. He had previously learned a great deal in regard to the keeping of sheep from Professor Perkins, and had profited by his advice. Following on the lines carried out at the Agricultural College he had heavily manured his wheat land. The result was that he had not beaten his neighbors much so far as the wheat crop was concerned, but he had as regards the carrying capacity of the land. He had this year 1,000 ewes and lambs, 22 head of horses, and other stock on 800 acres. He had not hand fed, and the stock were all in good condition. The only crop he sowed specially for sheep was from 100 to 150 acres of oats. He had fed down to September. He would like to know the difference in the expense of raising crops of, say, lucerne, kale, rape, and sorghum. The falling off in the number of stock in the Lower North was easily accounted for. The high price of land had caused farmers to cultivate half their holdings each year. The paper was one of the best ever read at any Congress.

Professor Perkins said it was exceedingly difficult for an experimental institution like Roseworthy College to arrive at a satisfactory estimate of the cost of various crops. They might be able to grow as good a crop as anyone else, but in nine cases out of 10 would not grow it so cheaply. He therefore always hesitated to give costs. He had never grown rape as a crop which received good cultivation. What he had done very often was to put the skim plough over the stubble, break it up 2½in., put a roller over the land, and then sow dry. Kale, on the other hand, had been a more expensive crop, because that had always been sown on land that had been broken up dry to a depth of 6in., and the land had had to be broken down like a cabbage patch. They used about 1lb. of seed to the acre and mixed it with bonedust—about ½cwt. of bonedust per acre. If kale germinated with the April rains they could not get a better fodder for sheep. They could postpone feeding it off to November, and then get feed to February. The sorghum crops had meant very little expense, because it had been sown on fallow. It was mixed with bonedust, like the kale. With lucerne there had been no expense beyond the seed. He had started with 2lbs. of seed to the acre, but had found that unsatisfactory, and had gone up to 5lbs. or 6lbs. This year he had sown as much sorghum as possible. He had sown it in August, but usually did so in September. It could be sown right through the year if there was enough moisture in the soil, but the ground must be warm.

Replying to further questions Professor Perkins said he had come to the conclusion that grazing sheep on land with stinkwort did not do them any harm. At one time he thought there might be something in the contention that stinkwort might perhaps be dangerous when in bloom, but his experience had led him to the conclusion that it was not. He believed in manuring the wheat crop heavily and then, though the full value was not got in the wheat crop, the residue was in the soil, and the forage crops got the benefit afterwards. He used the ½cwt. of bonedust with kale as a medium only for conveying the seed, and used the same quantity with sorghum and rape. He did not, as a rule, manure forage crops.

Mr. H. G. Johnston (Parilla) asked how many wires should be used on a sheep-proof fence.

Professor Perkins, as a rule, thought it wise to put in seven or eight.

Mr. W. Pannell (Geranium) asked for information with reference to spineless cactus.

Professor Perkins had been growing some plants of this during the past two years, and he believed it would be found very useful in dry areas. In Africa the natives used it for feeding all classes of livestock. It took some time to establish, and could not be cut for, say, three years. It would grow from portions of the stems.

Mr. W. Gum (Amyton) asked which would yield the best export lamb in the shortest time, the South Down-Merino cross, or the Lincoln-Merino cross.

Professor Perkins said the matter of the different crosses was a very difficult one to settle. His opinion was that the Lincoln was too large. As a rule the South Down was too small to put direct on the Merino.

Mr. W. Salter (Angaston) asked whether Lincoln cross ewes put to Shropshire rams would yield a good export lamb.

Professor Perkins said that at the College for several years it was found that the Shropshire cross did not develop as well as the South Down.

Mr. H. A. Giles (Mount Pleasant) had kept a crop of kale for as long as five years as a standby. The crop was fed fairly bare, the stock were then taken out whilst it developed, and later put back again.

Professor Perkins had never kept kale for longer than two years. The land was wasting to a certain extent.

Mr. W. E. Hannaford (North Boorborowie) asked whether it was better to grow any other forage crop where lucerne could be grown successfully.

Professor Perkins would keep to lucerne if it could be grown.

Mr. S. H. Schinckel (Naracoorte) stated that chou moellier stood feeding remarkably well. Last year he grew it with wheat and oats.

Mr. Geo. Jeffrey (Advisory Board) expressed his appreciation of the paper. Farmers in some cases were neglecting sheep, and he thought this a great mistake. In order to get over the difficulty of the high prices of land they were endeavoring to get their money back too quickly by cropping at frequent intervals. The bulk of the big stations in the North were being cut up, and to a large extent in the past these had been the source of the supply of fat sheep. He believed that the time would soon come when the bulk of the fat stock in the Adelaide markets would come from the farmers, and the sooner they commenced the systematic keeping of sheep the better for all. The markets of the world were becoming more and more accessible year by year, and there was no branch of the agricultural industry in which there was more scope for development.

In reply to a question from Mr. H. Billinghurst, Professor Perkins said that whilst wire netting was generally too expensive for sheep-proof fencing, it was certainly very effective. The cost of vetches was about 14s. per bushel, and about 20lbs. to the acre was the quantity to sow. He generally sowed the following quantities of the undermentioned grains:—Kale, 1lb. per acre; rape, 4lbs. to 5lbs.; mustard, 2lbs. to 3lbs.; sorghum, 5lbs. to 6lbs.; lucerne, 5lbs. to 6lbs.; and turnips, 2lbs. to 3lbs.

At 10 p.m. Congress adjourned till the following day.

(*To be continued.*)

ALTERATION.

On page 180 of the September issue Mr. A. M. Dawkins, in his address delivered at the Conference of Agricultural Bureau at Cowell, is reported to have said "Formalin had the advantage that it did not retard germination, but it interfered with the working of the seed through the drill." This should read "fungusine."

It is also attributed to him that he used 1oz. of bluestone to a bag of wheat, whereas his practice was to use 1oz. to a bushel.

THE WHEAT MARKET.

Under date London, September 5th, *Beerbohm's Evening Corn Trade List* states—"One of the reasons given for the improvement in the American markets this week is the reported consumption of wheat for feeding purposes owing to the advance in maize prices, but it is impossible at present to say whether the quantity so used will be of sufficient importance to have much effect on wheat values or not. The production of all feeding crops in the United States is very much smaller than last year, when practically all crops gave record yields, so much so that stocks of old maize, oats, &c., at the present time are much in excess of the average. This will modify, to some extent, the effect of the great deficiency in this year's feeding crops, but will not nearly make up for the shortage.

"The shipments from the United States, which have been on an enormous scale so far, are expected to continue liberal, but will no doubt be on more moderate lines than last month, and it remains to be seen whether the exports from Russia will increase sufficiently to make or more than make up for any possible decrease in the American figures. If Russia ships on anything like the lines of 1909, the total exports from all countries will certainly be more than ample for all the requirements of importing countries, at least for the first few months of the present season. The weekly exports from North America to Europe in September, October, and November last year amounted to an average of 616,000qrs., from the Danube 193,000qrs., the Argentine 110,000qrs., India 166,000qrs., and other countries about 85,000qrs. From India and the Argentine exports will probably be somewhat smaller than in 1912, but from the Danube, Australia, and North Africa, together, about the same as in 1912, or possibly a little larger.

THE WORLD'S VISIBLE WHEAT SUPPLY ON SEPTEMBER 1st.

	European. Qrs.	U.S./Canada. Qrs.	Total. Qrs.	Eng. Aver'ge. Price.
1913	8,210,000	7,090,000	15,300,000	32/7
1912	7,600,000	4,300,000	11,900,000	34/10
1911	8,580,000	7,245,000	15,825,000	31/11
1910	8,725,000	5,025,000	13,750,000	32/2
1909	5,845,000	2,250,000	8,095,000	38/5
1908	5,820,000	3,500,000	9,320,000	30/10
1907	6,860,000	8,500,000	15,360,000	33/10
1906	7,745,000	5,700,000	13,455,000	26/9
1905	8,085,000	2,850,000	10,930,000	26/11
1904	8,125,000	2,800,000	10,925,000	28/5
1903	6,105,000	3,075,000	9,180,000	30/-
1902	5,570,000	4,425,000	9,995,000	31/7
1901	8,750,000	5,430,000	14,200,000	27/-
1900	7,320,000	9,210,000	16,530,000	28/8
1899	7,425,000	6,400,000	13,825,000	25/-
1898	4,400,000	1,820,000	6,220,000	30/7
1897	4,580,000	3,110,000	7,690,000	31/8

Date.		LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
Sept.	6	Steady, no quotation	3/6½ to 3/7	3/7½	3/7
	8	—	Do.	Do.	Do.
	9	Quiet, easier tendency ; Liverpool very dull	Do.	Do.	Do.
	10	Quiet ; Liverpool steady, but quiet	Do.	Do.	Do.
	11	Firm, more inquiry for sailers ; May-June 4/6¾ ; Australian new crop. buyers at 4/6¾ ; Liverpool easier tendency	Do.	Do.	Do.
	12	Steady, quiet ; Liverpool quiet ; Australian new crop, 4/6⅞	Do.	Do.	Do.
	13	Steady. quiet	Do.	Do.	Do.
	15	—	Do.	Do.	Do.
	16	Quiet	3/7	Do.	Do.
	17	Quiet ; Liverpool dull, easier tendency	Do.	3/7½ to 3/7¾	Do.
	18	Dull ; Liverpool very dull	Do.	Do.	Do.
	19	Steady but quiet ; Australian off coast, 4/6⅜ ; Liverpool steady, quiet	Do.	Do.	Do.
	20	Steady but quiet	Do.	Do.	Do.
	22	—	Do.	3/7½	Do.
	23	Quiet ; Liverpool dull, easier tendency	Do.	Do.	Do.
	24	Dull and neglected ; Australian new crop, per sailer, 4/6⅜	3/6½ to 3/7	Do.	Do.
	25	Dull, offered lower ; Liverpool very dull	3/6½	3/7	3/6½
	26	Dull, easier tendency	Do.	Do.	Do.
	27	Dull and neglected	Do.	Do.	Do.
	29	—	Do.	Do.	Do.
	30	Dull and neglected, no demand	Do.	Do.	Do.
Oct.	1	Quiet	Do.	3/6½ to 3/7	3/6
	2	Dull	Do.	Do.	Do.
	3	Steady, but quiet ; Liverpool quiet	Do.	Do.	Do.
	4	Quiet	Do.	Do.	Do.

Steamer Freights.—(October 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 31s. 3d. per ton (10d. per bushel), October-November ; 32s. 6d. to 33s. 9d. (10⅖d. to 10⅘d. per bushel), new season ; to South Africa, 28s. 9d. per ton (9⅕d. per bushel), October-November ; 30s. (9⅗d. per bushel), new crop. Parcels, Port Adelaide to London-Liverpool, 27s. 6d. to 30s. per ton ($8\frac{9}{10}$d. to 9⅗d. per bushel) ; to Continent, 27s. 6d. to 30s. per ton ($8\frac{9}{10}$d. to 9⅗d. per bushel) ; Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel ; to Sydney, 10s. 6d. per ton (3¼d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 31s. 3d. per ton (10d. per bushel), old wheat ; 32 t o 33s. per ton ($10\frac{3}{10}$d. to 10⅗d. per bushel), new crop ; South Africa, 28s. 9d. per ton (9⅕d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

The General Manager of the Produce Department reports on October 1st—

BUTTER FACTORY.

There was a decided increase in the quantity of cream received last month as compared with August, and the quality generally was excellent. Butter was in great demand, and prices were easier at the close than at the beginning of the month. Present quotations are—superfine, 1s. 1d. per lb.; pure creamery, 1s. per lb.

A. W. Sandford & Co., Limited, report on October 1st—

BUTTER.—The production of butter and cream further increased during the month of September, and prices receded slightly, this being more apparent in private separator and dairy lines than in factory and creamery butters. Best factory and creamery, fresh in prints, are selling at 11d. to 1s. 1½d. per lb.; choice separators and dairies, 10d. to 11d.; and store and collectors', 8½d. to 9d.

EGGS.—The strong demand reported a month ago continued, and under its influence prices are very little easier than at the beginning of September. Quotations are—guaranteed new-laid hen, 9¼d. per dozen; duck, 10d.

CHEESE.—Values have kept up fairly well considering the substantial increase from local factories, heavy buying orders for oversea markets preventing stocks from accumulating. Present rates are 5¾d. to 6½d. per lb. for large to loaf.

HONEY.—Supplies of prime clear extracted have not been nearly equal to trade wants, both for local and export. The present price is 3¼d. per lb.

ALMONDS.—It being late in the season there are very few offering. Brandis are selling at 6d. per lb.; mixed soft shells, 5½d.; hard shells, 3d.; kernels, 1s. 5d.

BACON.—High prices continue to rule, owing to the shortage of the live hog throughout the Commonwealth, and values were well maintained during the month. Best factory-cured sides sold at 10d. to 11d. per lb.; hams, 11d. to 1s.; well cut and cured farm middles and rolls, 8d. to 9½d.; country hams, 9½d. to 10½d. per lb.

LIVE POULTRY.—Although the forwardings were extensive, keen competition kept values well up, so that all consignments participated in good prices; the demand bids fair to continue. Good table roosters brought 3s. 6d. to 4s. each; plump hens and nice conditioned cockerels, 2s. 6d. to 3s.; geese, 4s. 6d. to 5s. 3d.; ducks, 2s. 4d. to 3s. 4d.; pigeons, 10d.; turkeys from 6½d. to 10½d. per lb. live weight for medium to prime table birds.

POTATOES AND ONIONS.—It is many years since potatoes were obtainable in September at such low rates as have ruled recently. There are more sellers than buyers, and it appears inevitable that large quantities of off quality lines will be wasted this season. Sellers of Victorians continue to canvass the markets of this State, and in consequence of their operations the stocks held in the Mount Gambier district are not moving so freely as is desirable at this time of year. During the month prices have again eased. Onions.—This market has ruled steady throughout, and there are no indications of any immediate disturbance in values. Quotations.—Potatoes—Gambiers, £3 10s. per ton of 2,240lbs, on trucks Adelaide or Port; 4s. to 5s. per cwt. in the market. Onions—Gambiers. £7 5s. per ton of 2,240lbs. on trucks Adelaide or Port; 8s. to 9s. per cwt. in the market.

RAINFALL TABLE.

(From data supplied by the Commonwealth Meteorological Department).

The following table shows the rainfall for September, 1913, at the undermentioned stations, also the average total rainfall for the first nine months in the year, and the total for the nine months of 1913 and 1912 respectively:—

Station.	For Sept, 1913.	Av'ge. to end Sept.	To end Sept, 1913.	To end Sept,, 1912.	Station.	For Sept., 1913.	Av'ge. to end Sept.	To end Sept., 1913.	To end Sept., 1912.
Adelaide ...	2·67	16·76	11·91	14·96	Hamley Brdge	3·57	13·12	11·91	10·63
Hawker	0·84	9·38	4·88	8·07	Kapunda ...	3·80	15·88	15·29	13·36
Cradock	0·91	8·40	5·21	5·30	Freeling	3·03	14·23	15·66	12·94
Wilson......	0·71	9·09	4·91	8·01	Stockwell ...	3·34	16·29	14·28	16·11
Gordon	0·60	6·77	4·51	6·71	Nuriootpa ..	3·09	17·11	13·29	15·44
Quorn	1·33	10·74	5·48	12·09	Angaston ...	3·98	17·47	18·06	18·78
Port Augusta	0·89	7·10	4·00	7·71	Tanunda ...	4·49	17·85	18·63	22·76
Port Germein	1·91	9·65	6·25	8·02	Lyndoch ...	3·35	18·62	15·47	17·27
Port Pirie ..	2·24	10·13	7·25	7·71	Mallala	3·75	13·43	11·46	11·08
Crystal Brook	2·98	11·89	8·16	10·76	Roseworthy..	2·73	13·93	10·75	10·82
Pt. Broughton	3·16	11·40	8·36	9·72	Gawler	2·55	15·58	11·63	12·84
Bute	3·02	12·35	10·56	9·57	Smithfield ..	2·51	13·19	11·05	11·68
Hammond ..	0·98	8·29	4·27	7·45	Two Wells ..	2·28	14·53	8·81	9·35
Bruce	0·83	6·90	4·67	8·56	Virginia.....	2·63	14·18	10·22	11·74
Wilmington .	3·58	14·12	9·05	14·71	Salisbury ...	2·34	14·96	11·89	13·88
Melrose	4·25	18·43	11·17	15·42	Teatree Gully	3·15	22·62	14·90	19·80
Booleroo Cntr.	1·86	12·41	5·85	8·86	Magill	2·18	20·91	13·55	17·37
Wirrabara...	3·90	14·84	11·21	13·70	Mitcham ...	3·31	21·92	14·04	15·18
Appila	1·96	11·44	5·97	13·61	Crafers	6·22	38·48	27·42	31·63
Laura	3·98	13·89	9·92	10·82	Clarendon ..	4·10	33·17	17·82	21·08
Caltowie	3·27	13·28	9·42	10·03	Morphett Vale	2·61	19·18	12·91	14·56
Jamestown .	2·99	13·30	9·77	13·95	Noarlunga ..	2·13	16·71	9·90	14·82
Gladstone ..	3·42	12·26	9·05	9·91	Willunga ...	2·49	21·60	15·51	17·50
Georgetown...	3·71	14·46	10·57	13·00	Aldinga	1·68	16·84	12·39	13·19
Narridy	2·17	13·43	6·96	10·94	Normanville	1·21	17·27	12·05	13·43
Redhill.......	2·67	13·14	9·19	12·32	Yankalilla...	1·69	15·62	15·35	16·86
Koolunga....	2·61	12·32	7·80	11·11	Eudunda....	3·73	13·42	13·58	13·26
Carrieton ...	0·97	9·12	4·46	8·17	Sutherlands	1·99	—	8·03	8·42
Eurelia.......	0·77	10·09	4·11	9·59	Truro.......	4·22	15·58	18·72	18·69
Johnsburg ..	0·64	7·41	3·98	8·16	Palmer	1·98	—	12·11	13·59
Orroroo	1·26	10·47	5·71	8·87	Mt. Pleasant.	3·67	22·35	17·98	20·17
Black Rock...	1·20	9·17	5·56	8·60	Blumberg ..	4·35	24·62	15·93	20·79
Petersburg ..	1·25	9·87	7·55	9·73	Gumeracha .	4·80	27·42	19·93	23·94
Yongala	1·59	10·49	6·06	8·96	Lobethal ...	3·96	29·96	19·74	23·56
Terowie	1·39	10·22	6·52	8·65	Woodside ...	4·52	26·08	20·98	25·73
Yarcowie ...	1·36	10·53	8·79	9·77	Hahndorf ...	4·21	29·43	22·05	21·23
Hallett	3·07	12·80	10·70	10·79	Nairne	3·28	23·77	16·79	19·32
Mount Bryan	3·55	12·65	12·96	12·00	Mt. Barker .	4·14	25·65	20·09	22·01
Burra	4·00	14·20	11·76	14·07	Echunga ...	4·00	26·97	19·60	21·91
Snowtown...	2·70	12·54	8·52	10·43	Macclesfield ..	3·48	25·09	20·01	26·26
Brinkworth .	3·70	11·67	11·14	11·40	Meadows.....	4·94	29·15	23·79	24·83
Blyth.......	3·78	12·91	10·79	9·91	Strathalbyn..	2·90	15·56	14·88	13·87
Clare........	6·64	19·69	17·65	15·36	Callington ..	2·04	12·86	10·83	8·41
Mintaro Cntrl.	5·07	17·75	14·35	13·19	Langh'rne's B.	1·80	12·29	9·16	8·22
Watervale...	6·81	22·19	19·33	15·86	Milang	1·46	13·68	7·64	17·86
Auburn	4·88	19·53	13·97	12·17	Wallaroo ...	3·38	11·29	10·00	12·24
Manoora ...	4·04	14·47	11·15	10·25	Kadina......	2·69	13·13	9·25	11·55
Hoyleton ...	3·71	14·66	9·98	8·89	Moonta	2·54	12·44	10·52	11·04
Balaklava ..	3·22	12·68	8·54	8·28	Green's Plns..	2·98	12·80	9·69	9·60
Pt. Wakefield	2·25	10·59	7·76	8·55	Maitland ...	3·71	16·58	11·22	12·36
Saddleworth..	3·67	16·10	12·50	10·89	Ardrossan ..	2·44	11·35	10·40	9·78
Marrabel ...	3·56	14·34	11·40	9·87	Pt. Victoria..	1·94	12·50	8·20	10·70
Riverton ...	3·97	16·47	13·62	11·49	Curramulka...	2·01	12·50	10·68	10·93
Tarlee.......	3·61	13·87	12·30	11·75	Minlaton ...	1·92	14·60	8·72	11·00
Stockport ..	3·74	12·80	12·52	11·03	Stansbury....	2·13	14·04	11·03	12·27

RAINFALL TABLE—*continued.*

Station.	For Sept., 1913.	Av'ge. to end Sept.	To end Sept., 1913.	To end Sept., 1912.	Station.	For Sept., 1913.	Av'ge. to end Sept.	To end Sept., 1913.	To end Sept., 1912.
Warooka.....	1·74	14·01	8·68	10·50	Bordertown...	4·03	15·65	13·96	12·17
Yorketown .	1·59	14·72	8·49	11·30	Wolseley ...	4·60	13·71	13·46	12·45
Edithburgh .	2·09	13·69	10·30	10·72	Frances	2·79	15·74	12·28	15·67
Fowler's Bay.	0·47	10·51	7·96	8·97	Naracoorte .	2·44	17·89	13·90	18·13
Streaky Bay.	1·21	13·28	9·03	13·43	Lucindale ..	1·42	18·81	11·97	19·21
Port Elliston.	0·96	14·00	6·84	13·66	Penola.......	1·77	21·44	13·59	20·17
Port Lincoln.	2·00	17·11	10·18	17·41	Millicent ...	2·22	24·89	20·45	21·66
Cowell	2·92	9·49	6·85	8·16	Mt. Gambier.	2·34	25·53	19·59	23·79
Queenscliffe...	1·63	15·57	11·59	14·33	Wellington .	1·69	11·90	9·32	9·07
Port Elliot .	1·38	17·12	10·86	13·73	Murray Brdg.	1·90	11·16	12·27	8·29
Goolwa......	1·42	14·62	10·45	14·38	Mannum ...	1·52	9·39	8·23	5·68
Meningie ...	2·09	15·64	10·53	12·55	Morgan	1·79	6·66	5·37	6·36
Kingston....	2·26	20·47	14·40	25·95	Overlnd. Crnr.	2·34	8·37	8·91	6·96
Robe	1·33	20·91	14·24	16·39	Renmark ...	2·78	7·73	9·33	6·57
Beachport...	1·35	22·89	17·79	18·52	Lameroo ...	3·32	—	12·94	12·26
Coonalpyn ..	2·30	14·07	11·80	12·54	Tintinara ...	3·18	—	—	—

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Near Bridgewater.

AGRICULTURAL BUREAU REPORTS.

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Balaklava	*	—	—
Bandon	*	—	—
Beetaloo Valley	4 2	—	—
Belalie North	*	11	8
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Blackwood	421	13	10
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Booleroo Centre	403	—	—
Borrika	*	—	—
Bowhill	*	—	—
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Burra	*	10	14
Bute	411	—	—
Butler	413	—	—
Caltowie	*	11	8
Canowie Belt	404	—	—
Carrieton	*	9	13
Cherry Gardens	423	14	11
Clanfield	†	—	—
Clare	*	10	14
Clarendon	†	13	10
Claypan Bore	416	14	11
Colton	†	11	8
Coomandook	417	—	—
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Friedrichswalde	*	—	—
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Greenock	*	—	—
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Morphett Vale	†	—	—
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Narrung	432	—	—	Sutherlands	†	11	8
North Booborowie ..	*	—	—	Tarcowie	399	14	11
North Bundaleer	*	—	—	Tatiara	434	4	1
Northfield	410	7	4	Tintinara	435	—	—
Orroroo	*	11	—	Two Wells	*	—	—
Parilla	419	9	6	Uraidla and Summert'n	432	6	3
Parilla Well	*	—	—	Utera Plains	416	11	8
Parrakie	*	4	1	Waikerie	419	13	10
Paskeville	*	9	13	Warcowie	*	—	—
Penola	434	4	1	Watervale	*	13	—
Penong	*	11	8	Wepowie	†	—	—
Petina	*	—	—	Whyte-Yarcowie....	408	—	
Pine Forest	*	14	11	Wilkawatt	420	—	—
Pinnaroo	418	—	—	Willowie	400	3	7
Port Broughton	*	10	14	Willunga	*	4	1
Port Elliot	*	18	15	Wilmington	402	15	12
Port Germein	*	18	15	Wirrabara..........	402	18	15
Port Pirie	*	4	—	Wirrega	435	4	1
Quorn	*	—	—	Woodside	†	—	—
Redhill	408	14	11	Wynarka	420	—	—
Renmark	†	—	—	Yabmana	*	—	—
Riverton	*	—	—	Yadnarie	416	11	8
Roberts and Verran..	415	—	—	Yallunda	*	11	—
Saddleworth	*	17	21	Yongala Vale	†	13	10
Salisbury	*	7	4	Yorketown	*	11	8
Shannon	*	—	—				

* No report received during the month of September. † Formal report only received.
‡ Report omitted owing to pressure on space.

Where Branch meetings are mainly occupied with the reception of reports of Congress by delegates these will be classed as "formal."

ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

November 12th and December 10th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD)

Coomooroo, September 20.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. E. Berriman (chair), W. Robertson, E. Brice, F. Gregory, L. Avery, R. Brice, R. G. and H. Polden, W. Barber, A. H. Cooke, G. B. Lillicrapp, W. M. Robertson (Hon. Sec.), and two visitors.

Fencing.—Mr. R. Brice read a short paper on this subject. He urged the advisableness of paying attention to boundary fences in particular. Where timber was scarce, one wooden post at each interval of 14yds., with two T iron posts in between, would be found to make a substantial fence. Boundary fences should be wired as follows :—From the ground, first wire 6in., second 12in., third 19in., fourth 27in., fifth 33in., with a barbed wire on top, 3ft. 8in. from the ground. Strainers 3ft. in the ground should be put in at intervals of 8 chains. Wires in division fences could be placed from the ground—first 6in., second 13in., third 21in., fourth 30in., fifth 40in., the latter being barbed. A ⅜in. bit was most satisfactory for boring holes in the posts, as holes of this size did not so readily cause the wire to rust. The bottom two wires should be of No. 6 gauge. Posts should be barked and charred before being put into the ground. Mr. Polden advised two barbed wires on boundary fences, the second being run through the posts, which Mr. E. Brice thought would weaken the posts. Mr. Lillicrapp advised wood and iron posts alternately in boundary fences. Messrs. Robertson and Berriman also took part in the discussion.

Davenport, August 21.

(Average annual rainfall, 9in. to 10in.)

Present.—Messrs. Holdsworth (chair), Bothwell, Messenger, Goldner, Gosden, Sanderson, and Lecky (Hon. Sec.)

Poultry.—Mr. Messenger read the following paper on this subject :—" The maintenance of fowls that are kept in confinement or which have free range, at a minimum cost, requires extensive knowledge, which can only be gained by practical experience. They must be systematically fed under all circumstances. Fowls that have free range find their own living to a great extent, which of course reduces the cost of feeding. A serious mistake is often made by beginners and others who keep poultry in thinking that any kind of inferior grain or food is good enough for fowls. In my opinion, to get the best results one must give good wholesome food. It would be a difficult matter to give the exact proportion and manner in which poultry should be fed. Birds are kept in such a variety of conditions and circumstances that it is not possible to give positive directions to all, A person who observes the methods of feeding will often notice that the birds are overfed; this must be avoided. Hens that are kept for laying only should be kept in a moderate condition, should run for their food, and eat it up greedily. If they do not, then something is wrong with them. and they should be examined. Grain is to a great extent the natural food: but if on free range, where they can obtain plenty of worms, grubs, insects, &c., they should do very well without much hand-feeding. If they are confined in small yards or runs where there is no possibility of finding anything except what is given them, the following rule will be found a good one:—Feed as early in the morning as possible; give them a warm breakfast, consisting of two parts pollard and one of bran mixed with boiling water, not in a sloppy condition, but mixed 'short,' as it is called, which, on being placed in the feeding troughs or thrown down, crumbles. It is a good plan to boil the house scraps, meat, &c., while the fire is going, and in the morning warm them up and mix with bran and pollard, as mentioned. At midday give plenty of green feed, lucerne if possible, and good grain for the evening meal. Some poultry keepers give grain in the morning and mash at night, with green feed at midday. I am not prepared to say which method is best, because both have given good results. Feeding whole grain, wet or dry and no mash, will not produce the best results in laying, as the Maryland Station has conclusively proved. Three pens were tried. The first was fed on whole grain exclusively, the second whole grain and ground feed, and the third entirely on ground feed. The whole grain pen fell far below the others, and the ground fed pen led, although little ahead of the pen fed half and half. Eggs hatched equally as well when the hens were fed with ground food as with grain. They fed wet mash at night (believing it best for fowls to go to roost with their crops full of easily digested food) and grain in the morning thrown into the litter, to keep them busy during the day. Hens that are laying require much more food, also shell-forming material, such as lime in some form or other. Mix a little mortar and place it in the fowl yard so that they can pick it as required; it is astonishing how soon it will go. Also keep plenty of charcoal and grit handy, so that the birds can help themselves. These are all necessary to keep fowls in proper health and condition. Feeding occupies such a prominent part in the management of poultry that serious loss is often occasioned by want of study and observation. There are so many details that have to receive attention that it is wise to consider the best possible method to adopt for obtaining the best results and profit. The highest and best results are obtained by as varied a diet as possible. If eggs are wanted, nothing gives better results than green cut bone, given in fair proportion to other food, 1lb. being sufficient for 16 or 20 hens. But as it is not always convenient to do this unless one has a bonecutter (even then it requires a good deal of time and strength to cut for a lot of fowls), I have used meat meal, supplied by the Produce Department, Port Adelaide, with very good results. I would point out that green bone comprises food, grit, and lime all combined in one. Above all, I would strongly advise that all food given to poultry should be sweet and wholesome, as many ailments can be traced to inferior foods. I am not a believer in hopper-feeding. It is wasteful, and fowls will gorge themselves on whole grain if given the opportunity, and will become fat and lazy. It is far better to feed grain in litter, and to make them scratch it out. This will keep them in a good healthy condition. Careless or indifferent methods of feeding will not give satisfactory results; and if the fancier is not successful in obtaining good results from his stock (provided they are good, of course) he should lay the blame on his own neglect, and not put it down to bad luck." Members were in accord with the views expressed. It was mentioned that although there was abundance of shell grit there was difficulty in obtaining the sharp quartz grit which could be got near Adelaide, where stone crushers were at work. Some members mentioned that they cracked up old broken crockery as a substitute with satisfactory results.

Tarcowie, September 9.

(Average annual rainfall, about 15½in.)

PRESENT.—Messrs. F. Sanders (chair), W. Travers, J. O'Grady, J. Symons, D. Butterick, S. Harding, A. Kotz, M. McCarthy, W. J. Ninnis, W. S. Bennett, J. Dempster, A. Shrowder, G. G. Lines, D. Murphy, P. Reynolds, and M. Murphy (Hon. Sec.).

BEST SHEEP FOR DISTRICT.—Mr. G. G. Lines read a paper, from which the following is taken:—"The most suitable sheep for this district, in my opinion, is the Merino. The country around Tarcowie is very hilly. The hill is the home of the Merino, and the wool grown on hills is of better quality than that grown on plains, because the atmosphere is of a cooler nature, and the soil is not so salty. There is less magnesia, which has a tendency to dry the wool and cause the top to rot, thus reducing its value. The grass grown on hilly country is of a poorer class than that grown on plains, and consequently the lamb industry does not benefit us to the same extent that it does the people living on the level country. Our feed does not grow until September, and we only have it green for a few months. The Merino consists of different types, *i.e.*, the South Australian, the Tasmanian, the Vermont, and the Wangenella. The South Australian, plain bodied, strong woolled, is the sheep for the farmer. As this part is an agricultural district, we require a sheep with a strong constitution capable of eating food that would be wasted with the other stock. Strong wool means strong constitution. The wool of coarse sheep denotes that their skin and bone are of a coarse nature. The Tasmanian strain is a totally different sheep from the South Australian, and a sheep that grows a very fine quality wool, very dense, and carrying a lot of grease. The skin is fine and porous. Every fibre has a tube from the skin which has to be supplied with yolk or wool-fat from the body, and the more yolk the sheep produces the greater is the strain on the constitution. The South Australian sheep are not taxed in this way so much as the Tasmanian. Being of a coarser quality it has not so many crinkles or cups that hold the yolk. The strong wool scours much better than the fine wool, the former will give 50 per cent. wool whereas the fine fleece of the Tasmanian strain will only give about 32 per cent. to 34 per cent. wool. The grease is of no use to the wool buyer, but he prefers a little, because he is then sure that there will be no break. Never go for weighty wool and overlook bulk. The Vermont is a sheep with excessive leather and body wrinkles. It carries wool of wonderful quality, and very dense. In my opinion it is totally unfit for the farmer of South Australia. It requires plenty of green grass. During the last few years the New South Wales breeders have bought heavily in South Australia to cross with their sheep to produce a stronger wool and hardier animal. The Victorian sheep—the Wangenella—is between the South Australian and the Tasmanian. It carries a fleece with plenty of quality and good staple, and has a fair constitution. It has more quality than the South Australian, and more wrinkles on the body. These sheep have been crossed with a lot of the South Australian breeds to give more quality and density, but I am of opinion that these crosses will be a detriment to the South Australian Merino. I am a strong believer in the pure South Australian Merino. By keeping to the pure blood one can rely on the crosses; that is to say, if the sheep are on the strong side one can select a finer ram, and if too fine select a coarser ram and be fairly sure of the results. I recommend strength before quality for the reason that a strong wool sheep will stand more hardships than a quality sheep. The South Australian plain body sheep is a wonderful wool producer, and carries a fleece that always sells well. The commercial value per head will compare favorably with that of any other sheep in the Commonwealth." On September 19th the writer of the paper demonstrated in his wool shed the cleaning of wool, &c., and gave a number of hints of considerable practical value.

Willowie, September 16.

(Average annual rainfall, 11·90in.)

Present.—Messrs. D. McCallum (chair), S. McCallum, I. McCallum, and W. P. Foulis (Hon. Sec.)

Fodder Conservation.—In a paper on this subject Mr. W. P. Foulis drew attention to the necessity for storing food for all classes of stock. The paper read—" Ewes with lambs can be fed during a dry pinch, and this would prevent the lambs receiving a check. Probably, in a season like the present, it would not pay to hand-feed the ewes, but it is not often that we have such long dry spells during the lambing season. It would probably pay handsomely, however, during the short dry periods we sometimes have in April and May. The feeding of milch cows during the times when there is a scarcity of good succulent herbage in the paddocks should also prove profitable. Farmers are often buying butter when they should be selling it. In a district such as this heavy hay yields are not frequent, the district being noted for high grain yields and light straw. The seasons when the hay yields are heavy are the ones when the farmer is busiest, the fallows requiring more working, and laborers are also scarce and wages high. Even so, it will pay in the long run to give attention to this matter. First and foremost I place our present method of making hay; other means are supplementary to it. Every farmer owning 1,000 acres or more should endeavor to maintain a reserve of from 200 to 300 tons of hay. This is not an easy matter. It will be apparent long before hay time that there is going to be a heavy yield; anticipate it, and have all other work well in hand, Make all arrangements for hay-making early. Hire the necessary laborers, have the binders in thorough order. I have come to the conclusion that two binders are necessary. Many farmers cannot afford the first outlay, but those who are in a position to do so will find that it is more satisfactory, enabling them to get more hay down just at the right time, and the hay harvest is not lost if a mishap should befall one of the machines. Begin cutting before the crop is really ready, for in all probability it will be overripe before it is finished; it will also give more time for carting. Put all strength and labor into the work right from the commencement. It is advisable to cut very large quantities when the crops are extremely heavy, as this will relieve the necessity for cutting so much when the grain yield is greater in proportion to the straw. There should be a layer of timber or straw under the stack and one of thatch or loose straw on top. I consider hay chaff, when the hay is obtained from heavy crops, the most economical food for draught horses when only slow work is required of them. Often during our wet seasons good self-sown crops of black oats are grown. These, if cut, carefully stacked, and covered will be found very valuable in dry seasons. In fact, owing to the quantity of well-formed grain they contain, they make useful chaff. I consider it a good practice for farmers to grow from 10 to 20 acres of barley each year and store the grain for everyday use. The straw is short and the grain yield heavy. The grain produced on a given area is more valuable as fodder than the amount of hay that could have been cut from it. By feeding grain with the chaff the hay made in the seasons of plenty is made to last over a longer period, doing away with the necessity for cutting when the crops are light, and there is less work and time attached to gathering the grain. Barley straw can be cut and stacked, it being better for stock than wheaten straw. If grain is used a little of it can be chaffed and mixed with the feed. In Asia, Southern Europe, and Africa horses are fed on nothing but barley and long straw. Grain can be easily conserved, and straw will remain good for years. In times of drought this should prove a valuable fodder. During 1912 the working horses of Roseworthy College were fed on this, with the addition of a small amount of hay chaff, and were never in better fettle. Large quantities of straw should be stacked. This can be done at a time when farmers are not very busy. Salt should be freely sprinkled on it when stacking. I have often seen cattle keeping in condition when feeding almost entirely at a straw stack, and am sure that the mortality among cattle would not have been so great in the past if the conservation of straw had been attended to. The often despised wheaten or so-called 'cocky chaff,' is a useful foodstuff in seasons of drought. When the crops are blighted they are high in nutriment. I have worked my horses lightly on last season's chaff and kept them in good condition. Equal quantities of wheaten and hay chaff with grain make an economical ration. If carefully covered wheaten chaff will keep good for years. An adequate quantity of straw must be properly placed on and then carefully tied down. Farmers have often gone to the trouble of gathering their chaff together and then lost the best of it by faulty covering. It remains for the farmer himself to decide whether or not the chaff is more valuable than the loss of time occasioned by the use of the stripper. Ensilage is no doubt a valuable fodder, but on account of the cost of erecting the silo I do not think it should be stored as a reserve to be carried over several years, but used yearly as a means of lessening the demands made on other foodstuffs. I would provide a fodder reserve in the following order:—First fill the silo with whatever green stuff there is available, then cut and stack hay; in good seasons large quantities. Reap and store barley grain, and after harvest stack straw and gather wheaten chaff together and cover same. This must be done every year when the stuff is available, even if large quantities are already on hand. A few lean years will reduce it considerably, and if done every year the effort to keep up the reserve will not be so great. The heaping or stacking of fodder is not the chief point; the careful using of it is equally important. The feeding and working of horses play a very important part. The practice we often pursue of throwing as much chaff to our horses as they can gorge is not only wasteful but harmful to the animals. The conclusion has been forced upon me that the most economical way of feeding a horse is to limit its chaff and give a small amount of grain. We should also limit the number of working horses to absolute requirements. Care must be taken to get the greatest amount of work out of the teams. A common mistake is to overwork the animals after they have had a rest and are fresh. We go over large areas the first few days, and before we notice it the animals are fagged and slow, when no amount of feeding will get them back to the condition they were in at first. At other times we get over-anxious and endeavor to get over more work by forcing our horses. We do it for a few days, but in the long run it is a case of more haste less speed, and a greater quantity of fodder is required. We must find out what constitutes a fair day's work and stick to it. This will prove to be true economy. By selecting implements and machinery which are light of draught we will lessen the amount of fodder consumed." Mr. D. McCallum thought the conservation of fodder by farmers would to a large extent regulate the very high prices sometimes charged for chaff. Mr. I. McCallum said wheaten chaff would keep for a number of years if properly covered. Molasses sprinkled over straw whilst it was being stacked greatly improved it as a fodder.

Wilmington, September 17.

(Average annual rainfall, 18·26in.)

Present.—Messrs. D. S. George (chair), Hannagan, Duhring, McGhee, Zimmermann, Benier, Gloede, Schuppan, Pickering, Hill, Noll, and B. Jericho (Hon. Sec.)

Grubbing Trees.—In a short paper on this subject Mr. Hill said the work could be made much easier if the trees were rung and left until the leaves fell. The rain which fell would then be concentrated around the butt, with the result that the ground became soft. When the chain and lever gripper was being used particular care should be taken that the anchor chain was stronger than the others, as in the event of this breaking damage would most likely be done to the operator. The height at which the chain was attached to the tree was judged by its strength. If this were put too high quite likely the trunk would break off. If the tree were firmly fixed in the ground it might be advisable to dig a hole in the front and cut the roots, and if this failed, to dig right round the tree, and sever the tap roots. He preferred bark to sap ringing.

Wirrabara, September 20.

(Average annual rainfall, 18·91in.)

Present.—Messrs. E. J. Stevens (chair), C. F. H. Borgas, W. H. Stevens, E. Kavanagh, H. G. Hastings, H. E. Woodlands, F. T. Jettner, G. Hollitt, P. R. Hoskins, E. Hollitt, W. Marner, W. Bowman, S. Thistleton, J. Fitzgerald, A. R. Woodlands (Hon. Sec.).

Shearing.—In a short paper on this subject, Mr. C. F. H. Borgas said the farmer keeping sheep required an arrangement of yards which would allow him to draft and brand his sheep with ease. A well-ventilated shed, grated, and lighted should be provided. It was a good plan to have the grating made in small sections, which could be taken up after shearing, the shed then being used for storing implements, &c. A catching pen and tally pen should be provided, and the stands for shearers should be boarded, so that they might be swept up when the operation was completed. He recommended the farmer with the necessary means at his disposal to put in two or three shearing machines, and undertake shearing on behalf of his neighbors at a reasonable rate. Mr. Jettner preferred blade to machine shearing, and thought that wool-classing should be done before the sheep were shorn. Shearing in hot weather was to be avoided, as there was a danger of the sun affecting the following year's clip. Mr. J. Fitzgerald thought the machines would detrimentally affect the clip when used for a number of years in succession.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, September 15.

(Average annual rainfall, 18in. to 19in.)

Present.—Messrs. J. Burton (chair), A. Jacobi, Ryan, A. and F. Bartrum, Murphy, Reid, Joyce, B. Cox, and Curtin (Hon. Sec.).

Orchard Pests.—The following paper was read by Mr. L. Reid :—" There are several species of orchard pests with which we have to contend. I will deal with each one separately, and class them as I proceed. *Chewing Insect.*—In this class we have only one variety, codlin moth. This pest attacks the apple and the pear, and to destroy it it is necessary to spray with an arsenical compound. The first spraying should take place just after the petals fall, the calyx end of the young fruit is then fully open. When spraying see that some of the spray lodges there, as this is often where the grub enters the fruit. It is necessary to repeat the spraying in from nine to ten days for three times, as there are often two or three hatchings of caterpillars in a season. These pests can also be trapped as follows:—Take a piece of bag about eight inches wide, and so long that the ends will lap about 2in. when placed around the tree; tie it firmly in the middle about 1ft. from the ground, and double the top half down over the lower half. Any grub then crawling up the butt of the tree will go between the folded bag, and, as a rule, stop there. These bandages require attention about every 10 days, the grubs being destroyed. *Sucking Pests.*—These insects breathe through the back, and obtain their nourishment from the tree by boring into the bark. It is of no use spraying these insects with a poisonous composition. What is wanted is a composition that will block up the pores of the back and cause suffocation. In this class we have the following:—Black aphis of the peach, scale, red spider, and woolly aphis. Black aphis of the peach are hard to get rid of; they rapidly increase in numbers and necessitate several sprayings. Tobacco wash is very effective, and may be prepared as follows:—6lbs. tobacco, over which pour 1gall. of hot water and let it steep over night; dissolve 2ozs. to 3ozs. of soap in a quart of water and strain the tobacco wash into this, and add sufficient water to make 50galls. of spray. *Scale.*—The most effective way of destroying this insect is by fumigation with hydrocyanic acid gas under air-tight covers. Spraying with resin wash is very good, and this may be prepared as follows:—Put 10lbs. of washing soda into sufficient water to boil freely, add one and a half pints of fish oil or 5lbs. common soap and 10lbs. powdered resin; boil rapidly for one hour. Add sufficient water to make 50 gallons of spray. Red oil compound is also used for destroying this pest. Red spider is a very minute insect, but can do a lot of damage. Red oil compound is very effective in destroying it. These insects breed very quickly and two or three sprayings are necessary. Woolly aphis keep together in small clumps on the under side of the limbs or between the forks of apples. Red oil very effectively destroys them. The sand fly only attacks the fruit when it is nearly ripe. They suck out the juice and also discolor the fruit, making it totally unfit for marketing purposes. Keep the orchard free from weeds, especially thistles, as this will harbor them. Smoke is very effective in moving them. *Fungus disease.*—In this class we have peach curl leaf and shothole and scab of the apricot. For peach curl leaf Bordeaux mixture is a proven remedy. Spraying should take place just after the flower buds burst. It is of no use spraying if the leaves are out. For shothole and scab of the apricot spray when the blossoms are out and later when the fruit is half-grown. There are several species of birds that the orchardist has to fight against, and they destroy a lot of fruit. The worst of these are crows, starlings, minas, wattle birds, and rosellas. They soon get accustomed to scarecrows and rattlers. Shooting is the best idea. Birds are also one of the main factors in spreading insect orchard pests." Mr. Jacobi favored autumn spraying. For black spot on grapes this year he tried 1gall. of sulphuric acid mixed with 50galls. of water. Mr. Burton used 6lbs. of tobacco waste with 50galls. of water for black aphis on the peach. Mr. F. Bartrum thought citrus fruits the most payable to grow in the district. Mr. Ryan had secured best returns from peaches and Japanese plums. Mr. Jacobi preferred oranges and peaches, whilst Mr. Joyce favored apples and oranges.

Booleroo Centre, September 3.

(Average annual rainfall, 15·83in.)

PRESENT.—Messrs. W. Michael (chair), R. Stunton, B. Nottle, J. H. and J. Repper, J. and B. Kerr, J. Carey, sen., J. M. Carey, J. Carey, jun., W. Whibley, A. Schmitz, G. Ashby, D. Michael, H. E. Kirkland, B. Reichstein, B. Saunders, W. A. Giddings, and O. E. W. Burns (Hon. Sec.)

BULK HANDLING OF WHEAT.—Mr. J. M. Carey read the following paper:—"In the matter of handling, marketing, and shipping produce Australia appears to be behind most grain-producing countries. The elevator system and the bulk handling of wheat are in general use throughout the American continent, the result being less expense, quicker dispatch, and better opportunities for cleaning and grading the grain. Experts who were examined by the South Australian Royal Commission in 1907, which reported on the marketing of wheat, were almost unanimously in favor of the elevator system. The expedition with which wheat can be loaded in ships was testified to by J. M. Sinclair, the Special Commissioner appointed by the Victorian Government, who visited America and witnessed the system in operation. At Duluth, he said, 115,000bush. of wheat were weighed for a ship in 80 minutes, and in three hours three ships, with a capacity each of 80,000bush., were loaded from the elevator. This, he remarks, by our system would have taken weeks. There is no difficulty in dealing with bulk shipments in England. Major Norton, the South Australian Trade Commissioner, said, 'I have seen wheat discharged in bulk at several ports, and people always speak well of the system.' The unfriendly attitude of the wheat merchants has been the principal obstacle. The loss to the farmer in bags alone is a serious item under present methods. The report of the Royal Commission states—'In 1907 bags cost the farmer 7s. 6d. per dozen, and their return value weighed as wheat at 3s. per bushel is only 1s. 10d. per dozen. This represents a loss of £118,000 for a 20,000,000bush. harvest.' The merchants profit to that extent, and this may explain their opposition to any change in the system. Those who say it is no use attempting bulk handling, because the ships so far refuse to carry loose wheat, seem to assume that the export trade in wheat is the only trade. The home consumption of wheat in Australia amounts to 30,000,000bush., and every year the farmers bag that quantity, at a cost for the bags, sewing, and freight, of £300,000, to hand it over to the millers who have erected mill elevators, into which the wheat is emplied in order that they might be saved the expense of buying bags in which to put the flour. No country in the world is better situated than Australia for bulk handling. The harvester reaps, threshes, and cleans the wheat in the one operation, and delivers it loose and ready for the elevator. If the system is undertaken the best method for the farmers to adopt would be to erect several portable granaries of wood, measuring from 8ft. x 10ft. to 15ft. x 20ft., with a capacity of 1,000bush. to 2,000bush. These could be roofed, and when empty could easily be drawn where required. The wagon would need to be provided with movable wheat-tight boxes; into these the wheat could be passed from the granary, through an opening in the roof, either by hand or mechanical means. When the wagon reached the station, after being weighed it could be drawn on to a platform raised sufficiently to cause the wheat to run; a shoot or plug withdrawn, and in a few moments the load transferred to a large bin, whence it is raised by machinery into the elevator building. The farmer would receive his receipt for so many bushels of No. 1 or No. 2 grade of wheat, such a receipt being a negotiable document."

COMPULSORY REGISTRATION OF STALLIONS.—In a short paper on this subject Mr. Reichstein expressed the opinion that the introduction of compulsory registration and examination of stallions would result in an increase in the service fees and higher prices for horseflesh. Farmers just commencing were unable to pay the fees of the high-priced animals, and the proposal would therefore be a hindrance to the expansion of agriculture.

Canowie Belt, August 20.

(Average annual rainfall, 20·04in.)

PRESENT.—Messrs. E. T. Daly (chair), C. W. Dowden, A. F. Dempsey, J. Sparks, A. Kitschke, G. Longbottom, G. Kirk, A. Spavin, J. J. O'Loughlin, R. J. Carter, W. A. Carter, H. A. Wedding, E. W. Noll, A. E. Burton, F. A. Schultz, J. Flower, S. B. Crouch, C. O'Mahoney, A. Noll, H. Schultz, J. Henschke, H. Brooks, J. O'Mahoney, F. Heinrich, H. Cole, and F. D. D. Stapley (Hon. Sec.)

FALLOWING.—A paper on this subject was read, and the following is extracted:—"Land that is intended for fallow should be cultivated after harvest so that the weeds germinate early and a clean crop is the result. The best time to fallow is from the middle of June to the end of August, if it is done later than this it does not give the weeds time to grow before the time for cultivation arrives. Dirty crops in most cases are the results of late fallowing. When fallowed early the land receives the winter rains, so that with thorough cultivation later in spring more moisture is conserved. In this district the best depth to plough is from 3in. to 4in. according to the nature of the soil. Flats and heavy dark land can be ploughed to a greater depth to an advantage. Land that is likely to run together should not be ploughed when too wet; it tends to set very hard, and the cultivator does not tear it up satisfactorily. Ploughing in straw is beneficial in such cases. In September, after light rains so that the top is moist, I advise cross harrowing the ploughing. If a set of heavy harrows is used they not only destroy the weeds but leave the land in a good condition for cultivation later in the spring. After the weather has settled in October the cultivator can be brought into use. This leaves time to go over some again if needed. I prefer the skim plough or a disc where land is suitable for such an implement. They cut and turn the weeds down and leave the land in an even state. The harrows should follow the cultivator, and every fall of rain through the summer months. To have the land in a fine state for seeding is essential. In the absence of rain the seed must be put down into the moist ground under the dry loose top soil and a better germination is assured. Where the fallow carries sufficient grass the sheep can be put on to prevent this going to seed. To plough the ground when dry makes it cloddy and encourages takeall to a certain extent. This can be got out of the land by sowing a crop or two of oats. A crop of oats for hay now and again where land is infested with weeds will help to clean it."

Horses on the Farm.—Mr. R. J. Carter also contributed a paper, in which he said—"It must be admitted that the bulk of the work connected with farming occurs in the paddocks, therefore in selecting or breeding working horses we should give special consideration to the stamp for pace and general usefulness together with capacity for showing condition. Many a horse is of such a build that it never looks well however good its condition. Now a great number of farmers make the mistake of breeding from whatever sire is convenient regardless of shape or pedigree, with the result that a large percentage of the horses on their farms are of a nondescript type: they eat the feed of a good horse, but it generally takes two of them to do a good horse's work. If a man considers the economic working of his farm as well as its productiveness, he will soon find it false economy to keep a bad horse because he bought it cheap, for in lean years, when horse feed is valuable it will soon equalise matters in this respect. The most suitable class of horse for farming in our locality is a cross between the heavy breeds, such as Shire or Clydesdale sires, with the clean legged mares, such as Suffolk Punches. This gives a heavy topped horse on short strong-boned legs, a horse with a stout constitution and plenty of pace, the class of horse that will keep up its condition, because it is the right build for the up and down hill work necessary on our local farms. If a farmer's main object is to raise something for market he should certainly avoid crossing with clean-legged mares, because there is no doubt that the big horse with the heavy legs is the animal to catch the eye and bring the most money. Experience has taught us that this horse is not the best on the farm, but excels in slow heavy road work. It is almost impossible for a farmer in ordinary circumstances to go in for pure bred draughts, because the initial outlay is so great and such a large percentage of good mares prove barren: this generally results in a balance on the wrong side of the ledger. It is a regrettable fact that very few farmers, particularly the young men, take any pride whatever in their teams, and draught horses as a hobby is quite out of the question with most of them. *Roadsters.*—There is generally a great diversity of opinion in the matter of hacks and harness horses. Personally I have had experience with most classes of roadsters, horse and ponies, hackney ponies, Welsh ponies, racing ponies, trotters, thoroughbreds and mongrel breds, and I find most of them good in their place; but some it would be hard to place. In hilly country, as a general utility animal, the pony is of little value. The need of our immediate locality is hacks—the progeny of the rough blood mare mated with the big thoroughbred sire. For harness horses we can mate the same mare with a good sound, clean limbed trotter stallion. The reason for doing this is that the symmetry and characteristics of the sire usually predominate in the progeny, thus giving us the heavier sort for harness and the lighter for the saddle. This same rule applies to draughts, and it would be well to remember that we have a much better chance of improving our stock by selecting good sires than by giving the same attention to the mares, because the sire invariably has a dominating influence. On no account would I use a draught stallion as a means for getting roadsters. Very often success attends the mating of draught mares with blood horses, but to cross them the opposite way is usually a failure. In this district it is best to build stables facing north where possible, as that is the point from which we get least severe weather and more sunshine. The sun helps to keep the stable warm and dry, which is necessary in keeping up the condition of our stock in the winter. If horses come in from work of an evening with a sweating coat and are turned into a bleak, damp stable, no amount of feed, no matter how good it is, will improve their condition. Every farmer should have a couple of stalls at the least penned off to close in any timid animal that may not get enough to eat otherwise, or to shut up the mares in foal and so avoid the chance of their getting bumped. A generous application of the dandy brush on the shoulders will repay handsomely. A little gall cure should be rubbed into any sores on the shoulder. This we find is a very good thing, especially if the horse is not working It is advisable for farmers who crop and fallow most of their ground to have a shelter shed for young horses. To feed these economically it is a good plan to sheave a few loads of good straw and mix with a similar quantity of hay. Put it through the cutter as required and feed it to the young stock in feeders."

Crystal Brook, September 20.

(Average annual rainfall, 15·62in.)

PRESENT.—Messrs. Lovelock (chair), H. and S. Billinghurst, G. Davidson, B. Flavel, H. Growden, R. Heaslip, W. Hutchinson, A. Macdonald, M. P. Pavy, J. Pridham, H. Sutcliffe, H. V. Sargent, R. R. Shaw, J. H. Shearer, J. Teakle, W. J. Venning, M. and B. Weston, A. J. L. Wilson, C. J. Jenner, G. Gum, A. Munday, W. W. Robinson (Hon. Sec.), and one visitor.

SHEEP.—The following is taken from a paper read by Mr. Pavy:—"No animal will shift for itself so well or respond so readily to careful husbandry as the sheep. It is surprising, even to the experienced man, how quickly a sheep will change from a grazier's 'store' to a butcher's 'prime' if given all the suitable food, water, and shelter it requires, not neglecting to increase the value of its fleece—more or less according to the breed—meanwhile. So the question I wish to deal with is: Will it pay to give our sheep more attention in the future than we have in the past? I think it will. America is beginning to realise that Australia can grow wool, and is taking off the import duties on that article. Germany is proposing to lower her import duties on meat. Both countries are extensive buyers, and the Panama Canal is to be opened in the near future, which should mean less freights on some of our exports: factors which point towards an improvement in an already good market in England for such products. Being assured that we have the market, the problem before us is: How can we get the maximum profit out of the land when its carrying capacity varies considerably, even from month to month? The case needs a sound and definite system. The inconsistency of our seasons renders it difficult to formulate one. It is of the utmost importance not to over-stock. Any experienced man knows that this is vital. Four sheep well fed will give better results than six insufficiently fed, and six sheep well fed will give still better results than four equally fed. So in these districts where agriculture has proved successful, and in most seasons heavy crops of wheat, oats, barley, &c., can be grown, it is not wise to let the fear of over-stocking carry one too far the other way, for this also means a decrease in profits. Last year the upper and lower nothern districts carried about 270,000 sheep, Why not increase this number to half a million? Can it be done without lessening the wheat production? The subject is worthy of consideration; worthy of definite experiment to determine how much food a sheep will eat per day? What kinds fatten best? What grow the best wool? What can be most profitably grown without lessening the wheat-producing capacity of land in the various districts? What is the extra cost of hand-feeding over grazing? Will it pay? Professor Lowrie recommends the growing of oats and peas; Professor Perkins recommends growing barley on the stubble, and Mr. Birks, of Wandearah, had met with much success in growing rape in his district. The excellent feeding value of these crops is well known. Success with rape seems to me to be more or less dependent on rain falling at the right time. Oats and barley can be grown during the rainy season and stored and fed when the rain fails. Will it pay better to sell these crops in the form of hay or barley, or as wool and mutton or fat lambs? There is not much data to work upon, but an American authority states that a sheep will consume about 3lbs. of food per day, and 900lbs. of good food will produce 100lbs. of lamb. This, if correct, means about six lambs per ton, or 12 lambs per acre where a 2-ton crop can be grown, and where four lambs can be fattened by grazing 2 tons might be expected if the crop were well put in. At 10s. per head six lambs should result in a return of £3 per ton for hay. Besides seeds of weeds are taken from the land to be returned, after having their germinating qualities destroyed, in the form of manure, adding humus to the soil and promoting the activities of bacteria. At all events one thing is sure—the better feed sheep receive the better they pay, and the better the breeding and selection of breed to suit the conditions and feeding, the greater will be the return. If wool is the chief aim, either the coarse-woolled, big-framed Merino or the medium Merino will be most suitable. The small, very fine-woolled Merino is not suited to farm life. If mutton and fat export lambs are wanted some old English blood is essential. There are about 30 different long and short woolled English sheep. The cross advocated by Professor Lowrie, *i.e.*, Merino and a long wool, say, Lincoln or Liecester for the ewe, mated with a short wool, say Southdown or Shropshire, produces a lamb that for early maturity, quality, and shape is as hard to beat as the Merino is for wool, provided sufficient suitable food is given." Mr. Venning thought the revision of the American wool tariff, the German meat tariff, and the opening of the Panama Canal would provide a great impetus to Australian industries. He had fed sheep on chaff and found it profitable. Mr. B. Flavel thought increasing the stock-carrying capacity of the land, as suggested by the writer of the paper, would be found unprofitable. The only means of storing feed during a good season was by stacking it. Mr. Billinghurst pointed out that the demand for meat throughout the world was rapidly overtaking the supply. The possibility of starvation on this account had been considered by Malthus prior to the opening up of the Russian, Canadian, and Argentine sources of supply. Although his theory had in some quarters been ridiculed, it was quite evident that the problem would eventually have to be faced. Mr. Shaw mentioned the manurial benefits which were derived from sheep on the farm. Mr. Heaslip thought it would not pay to feed these animals on hay costing £4 per ton. Mr. B. Weston had fed a flock this year for three months on short flaggy hay, slightly blighted. Wethers thus fed had realised 30s. per head in the Crystal Brook market (the highest price paid for any sheep during the year). Ewes also did well. He gave one sheaf to every three or four sheep on alternate days. On this the ewes reared an 85 per cent. lambing to excellent condition. It was not advisable during a poor year to keep the animals until the wool broke.

Gladstone, September 6.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. R. E. Lines (chair), W. Brayley, T. Hollitt, T. Mutter, R. A. Humphris, H. Fay, G. M. Black, E. H. Davies, A. B. Blesing, F. Aughey, J. Eley, R. Coe, J. Coe, S. Masters, G. Fisher, J. Page, A. E. Dinning (Hon. Sec.), and four visitors.

ENSILAGE.—The following is taken from a paper written by Mr. G. M. Black on this subject:—" The following can with advantage be used for ensilage:—(*a*) Wheat and oats that have been sown for grain and hay, and in October contain too large a percentage of wild oats and turnips. Portions of these crops, if left, would make very poor hay, and yield very low returns of grain. If cut when green they can be utilised for this purpose. (*b*) If the stock are turned out of the grass paddocks in a good season about the beginning of August, clover, barley grass, &c., will be found growing, and this will make good ensilage. (*c*) Maize, sorghum, peas, and vetches can be grown for the purpose. In our district I believe the cutting out of the portions of the wheat crops dirtiest with turnips would make good filling for a silo, and at the same time it would help to clean the land. No dry fodder must be put into a silo pit. With oats it is wise to cut just as the head comes out. By stacking the fodder a certain amount of waste around the edges is incurred. Pit ensilage is made by putting the fodder in even layers into cemented or earth pits, and taking particular care that it is evenly spread all around the pit. Overhead tank silos are coming more into vogue during the last few years. Hawkesbury Agricultural College possesses a very good one. The filling, which consists of maize, is chaffed before being raised by the elevator. The fodder should be well weighted by means of iron, logs of wood, or bags of sand. An average crop of green stuff yields from 7 tons to 9 tons per acre, and the same crop cut for hay would yield about 2 tons. With the exceptional feeding qualities that ensilage possesses in the production of milk, everything is in favor of the use of the fodder for ensilage. If it is intended to feed it in the paddocks it is better not to cut or chaff it. The temperature of the pit should be kept at about 130° Fah. to get a good sweet ensilage. A lower temperature results in the fodder being too sour. A rough pit can be made at little cost by erecting pug walls and then plastering these. The crop should never be allowed to lie more than four to five hours before being put into the stack or pit. A little rain will not delay operations, as is the case when handling hay. Ensilage can be fed to all classes of stock. Cows and sheep have a special liking for it." In reply to questions, the writer of the paper said the failure to produce sufficient heat by pressure on the fodder was the cause of the ensilage turning out sour. No danger was incurred by putting the crop in wet; in fact, during the latter part of the year it was usually better to do this. About four months after it was stacked the contents of the silo would be matured.

Leighton, August 23.

(Average annual rainfall, 16in. to 17in.)

PRESENT.—Messrs. A. McDonald (chair), M. Hogan, R. Fairchild, S. Corden, S. Williams, R. Humphreys, T. Goodridge, R. McWaters, A. E. McWaters (Hon. Sec.), and two visitors.

HAY AND STRAW STACKS.—Mr. Hogan, in a short paper, recommended binding and stacking straw as a provision against shortage of feed in dry seasons. Twenty-five tons of clean straw chaffed with 50 tons of good wheaten hay would make substantial feed for horses when they were not being worked too heavily. Cocky chaff and molasses constituted good winter feed for cattle. If possible, lucerne should be grown, the crop being cut and stacked at least twice yearly.

Mundoora, September 22.

(Average annual rainfall, 14·11in.)

Present.—Messrs. W. J. Shearer (chair), J. Clothier, C. H. Button, C. E. Dolling, W. Aitchison, J. A. Owens, J. Stringer, T. Reardon, and G. F. Johnson (Hon. Sec.).

Draught Horses.—Mr. Clothier read a short paper in which he estimated the cost of rearing a draught horse at £17 18s. The service of the stallion cost £2 5s., but as the percentage of foals yielded was about 50, the service fee for each foal could be reckoned as £4 10s. The loss of the use of the mare for two months at foaling and other incidentals brought the total to £7 10s., and two years' feed was estimated as costing £10 8s. He concluded, therefore, that £20 was the lowest price at which a 2-year-old colt or filly could be profitably sold. Mr. Shearer thought the fee of a first-class stallion would be at least £3 3s., and Mr. Button mentioned that the percentage of foals received was sometimes only about 33.

Redhill, September 16.

(Average annual rainfall, 16·79in.)

Present.—Messrs. F. Wheaton (chair), McAvaney, Pengilly, Campbell, Treloar, Coffey, A. and R. Dick, E. Steele, P. H. and F. A. Wheaton, J. Hayes, J. Kelly, W. Hayes (Hon. Sec.), and two visitors.

Dairying.—In a paper on this subject, Mr. Pengilly said that through lack of interest and mismanagement farmers were in some cases allowing their dairy herds to become degenerate and unproductive. Those herds which were a credit to their owners were the result of careful breeding from sires of quality. Where bulls were allowed to run with the cows at all times heifers were brought in too young. He recommended the co-operative purchase of good bulls. Choice could be made from the Shorthorns, Durhams, Ayrshires, Herefords, and Holsteins, but owing to their lack of beef production the Alderney and Jersey were unsuitable for the farmer. The cow that would average 7lbs. or 8lbs. of butter per week for a term of 38 weeks was well worth her place in the dairy herd if she could be disposed of to advantage for beef. The animals should be in full profit during April, May, and June, as there was then generally a good supply of greenfeed available, and good markets were ruling. The co-operative purchase of a milk-testing outfit was also recommended. Mr. Wheaton agreed that it was advisable to systematically test cows. Mr. Coffey thought it advisable for farmers to practice dairying on a larger scale. He favored the Ayrshire. Mr. F. A. Wheaton preferred the Red Poll.

Whyte-Yarcowie, August 23.

(Average annual rainfall, 13·91in.)

Present.—Messrs. G. F. Jenkins (chair), Lock, G. R. and J. R. Mudge, Robinson, A. and F. Mitchell, J. E. and F. Hunt, J. Walsh, G. D. Mudge, E. J. Pearce (Hon. Sec.), and one visitor.

Lambs for District.—In addressing the meeting on this subject, Mr. F. H. Lock said that there was a general idea that the Merinos were most satisfactory in this district, as, should the season prove adverse for fattening lambs, they could be held over for wool, which would in some measure compensate for the failure of the lambs as freezers. Practically, however, there was a difference, as in almost every season some of the lambs were fit for the freezers. These were sent away and the poorer quality stuff was retained on the farm, with the result that the flock deteriorated. If this State was to hold its own in the export market it was necessary that a more shapely carcass should be produced. The Shrop. cross was perhaps the best in this respect, but the wool was so inferior, short, and scraggy as to be a great drawback. The Leicesters, whilst not quite so shapely grew good wool and were good doers. The best lambs for freezing could only be bred from cross-bred ewes, say Merino-Leicester cross, then using a Leicester ram. The main difficulty of procuring a cross-bred ewe then arose. He understood that some of the smaller flockowners on the margin of cultivation were going in for raising stock to supply this demand, and he thought it would pay them well. Attention should also be given to growing fodder for lambs where possible, and there was nothing better than peas if they could be grown. In the discussion which followed Mr. F. Mitchell supported the views of the speaker. He was using Leicester rams, and had obtained a splendid percentage, with practically no lambing troubles. He had lost a number of lambs through the Merino ewes being too woolly, the wool and burrs interfering with the lamb sucking. Mr. G. D. Mudge said the greatest fault he had found with the Leicester was the late and prolonged lambing. The lambs were good and did well. The cross-bred ewes were prolific and good mothers, but they required good fences to keep them in the paddocks. Mr. Hunt preferred the Shrop.-Merino cross for lambs. He had had no experience with Leicesters, but had tried Lincolns and could not recommend them. The Chairman did not agree with Mr. Lock's ideas in regard to the Leicester-Merino cross for lambs. He had tried both and preferred the Shrop. ram and Merino ewe for the conditions in this district. Those who most strongly advocated the Leicester, including Professor Lowrie, did not recommend it for the purpose of breeding a freezer from the first cross with the Merino, but for the purpose of rearing cross-bred ewes, which. when mated with one of the Down breed of rams, would breed the ideal lamb for export. Great difficulty would prevail in farmers breeding cross-bred ewes. It would necessitate the keeping of three flocks on the farm. He thought that the small pastoralist was doing too well breeding pure stock to trouble about breeding cross-breds to supply this demand. He had not attempted to raise his own breeding ewes. If he could purchase a suitable Merino ewe off'shears for 10s. he thought it a better proposition. He did not agree with Professor Lowrie that it was better to pay 16s. for a cross-bred. He agreed with Mr. Lock that selling the best lambs and keeping the culls was suicidal, and should be avoided at all costs.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Blyth, September 20.

(Average annual rainfall, 16·46in.)

Present.—Messrs. A. L. McEwin (chair), J. S. McEwin, J. B. Kuchner, F. Wiltshire, C. W. Zweeh, J. Pratt, A. A. Schultze, W. J. Ninnes, R. Buzacott, C. Lehmann. C. P. Schuster, F. T. Pedler, S. Hamilton, J. Williams, H. Newmann, D. Crawford, J. T. Harmer, A. Dunstone, W. Reinke, jun., J. R. Evans, A. D. Pedler, H. W. Eime, Dr. A. V. Heynemann, W. O. Eime (Hon. Sec.), and five visitors.

Farm Labor.—Mr. A. Hamilton read a paper on this subject. Owing largely to closer settlement, and the quantity of new land being brought under cultivation, he said, there was a growing scarcity of farm labor. The proposal to import lads from England, and train them specially for farm work, was to his mind a good one. Youths naturally adapted themselves more quickly to the conditions of the country, and the three years apprenticeship would not only be in the interests of the employer, but the employés also. He suggested the inauguration of a system of labor exchanges throughout the country, by means of which surplus labor in one district could be drafted to those in which there was a scarcity. Mr. A. L. McEwin thought it better for the farmer to keep a man all the year round at a fair wage, rather than pay a high rate during harvesting. Mr. Wiltshire preferred the employment of the married man, and members generally agreed that the idea of having a labor exchange in each town was a good one.

Gawler River, September 19.

(Average annual rainfall, 17in. to 18in.)

Present.—Messrs. W. J. Dawkins (chair), A. J. Bray, F. Bray, A. M. Dawkins, J. Hillier, G. Higgins, F. W. Roediger, J. Hayman, E. Winckel, B. F. Hillier (Hon. Sec.), and one visitor.

Sheep on the Farm.—In a paper on this subject, Mr. J. Hayman said one of the difficulties of rearing sheep on the farm was that of securing suitable ewes, which had been accentuated since stations in the Lower North had been cut up. Merinos bred in the Far North were not satisfactory; they were often small and very wild; the South bred ewes were better woolled, but seemed lacking in constitution. If English Leicester ewes could not be secured, Merinos should be purchased, but frequently those sold from the stations were culls, coarse, wrinkled, or with yellow, yolky fleeces. If 100 ewes were required, he advised purchasing, say 120, using 20 of the worst for rations. The 100 ewes could be mated with two English Leicester rams, the ewe lambs being kept for breeding. If fat lambs were required it was best to use Southdown rams. If ewe lambs were to be reared a big framed, long-stapled Merino ram could be used. Continuing, the paper read—"The ewe lambs can be kept as before and again put to a Merino ram. The ewe lambs from the second cross to Merino should be put to a Leicester ram; by this means it is possible to rear the ewes required. It is easier to change the rams than the ewes. The sheep described fatten readily, they are very quiet, and the wool sells at a good price. If Shropshire, Southdown, or Dorset rams are used the whole of the lambs should be sold; they are not satisfactory to breed from, the wool is light per sheep and low-priced. There is a difficulty in having the ewes lamb during April and May. If a farmer drives a drill or cultivator during seeding there is no time to look after lambing ewes, and, if neglected, foxes, eagles, and the blowfly soon reduce the profit on a small flock. There is another difficulty; if ewes lamb during the months mentioned stinkwort plays havoc with them, but if they are timed to lamb later, say during June, the stinkwort having died on the approach of cold weather, this trouble is overcome and the sheepowner, having finished with seeding, can look after the ewes. It has always been the practice to get early lambs; the local market is easily glutted, and export buyers do not come soon enough to relieve the position. If the season is good the lambs become too big, or, if the season is not so good, they go off, and lose the bloom so necessary in a good lamb. By having the lambs a little later there is little to fear from cold, as the Leicester seems to be hardy. Also there is a better prospect of good grass by this time and the lambs will grow very fast, and not be stunted as so many early lambs are. These are inclined to get through the fence. Farmers are advised, and rightly so, to use more super. per acre. This brings another difficulty to the sheepowner in the shape of a rank growth of clover, the burs of which stick to the wool and lessen the value considerably. Sheep kept on farms will have to be dipped, on account of the spread of lice. Infested animals will not thrive; they seem to be always rubbing against fences, trees, &c. The wool suffers damage by the rubbing, and a lousy sheep looks ragged, miserable, and unthrifty. Even if the profit does not appear very great, it pays to keep a few sheep. They help to keep the land free of weeds, or at any rate keep weeds from seeding until teams can be spared to work the fallow."

Mallala, September 1.

(Average annual rainfall, 16·88in.)

Present.—Messrs. J. Curnow (chair), F. A. W. Konzag, W. H. Temby, D. Argent, E Penfold, S. J. Temby, J. Nairn, A. E. Temby (Hon. Sec.), and one visitor.

Skim Cultivator v. Plough.—The paper written by Mr. F. Mitchell, of the Whyte Yarcowie Branch, and published on page 1422 of the July issue, was read by Mr. Nairn. In supporting the contentions of the paper writer, Mr. Nairn said his experience went to show that land fallowed with the cultivator gave better results, especially in dry seasons, than that ploughed. The essential, he said, was a fine seed bed with a firm bottom. Mr. S. Temby favored the use of the plough, and Mr. Penfold recommended shallow working and shallow drilling. The disc drill was better than the hoe, as it did not bury the seed so deeply. Mr. Konzag had secured best results from shallow working, and Mr. Curnow recommended the use of either a disc plough or cultivator for fallowing.

Northfield, September 2.

(Average annual rainfall, 19in.)

Present.—Messrs. Williams (chair), Wright, Goldney, Kester, Dall, Rowe, Reynolds, Kelley, and Mitchell (Hon. Sec.).

Feeding Horses.—Mr. E. Kester read a short paper on this subject. Horses, he said, should be fed at regular hours and given as much as they would readily eat. This amount could only be determined by careful observation. It was a mistake to give the animals sufficient to keep them eating all night, and too much chaff did them no good, especially in the case of young horses, as eventually they would not be able to eat long hay. Long feed should be given at night. The subject was discussed at length, each member advocating different methods of feeding.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Bute, September 16.

(Average annual rainfall, 15·42in.)

PRESENT.—Messrs. W. J. Hall (chair), W. Sharman, H. Schroeter, A. Schroeter, B. Lamshed, M. Stevens, W. T. Matthews, E. W. Bettes, and L. E. Simon (Hon. Sec.).

PIG-KEEPING AND BACON-CURING.—The Hon. Secretary read a paper. He advised every farmer to keep two or more pigs, especially if he kept cows. The paper read, continuing—"When pigs are young they only need light food, such as stale milk, slops from the kitchen, or cabbage leaves, &c. Great care should be taken that they are not given too much. The troughs should be well cleaned before any fresh food is put in The amount of food should not be too much at a time, and they should be fed three times a day. Two young pigs, 12 months ago, were purchased at 10s. each. After being fed for about 10 months they were killed, cured, and sold at 10½d. per lb., bringing in £14 for the two. These animals should not be shut in a stye all the year round. There should be a small yard connected with it, wherein the pigs could move about, and they would naturally keep the stye clean, and it would not give rise to such an objectionable smell. This yard could be about one chain long and half a chain wide, fenced with posts, barbed wire, and pig netting. The pigs could roam about in this until such time that they are intended to be fattened for killing. Then they should be closed in their sties and given good solid food, such as pollard or grain. It would pay to keep a good sow to breed the pigs, and it would also pay one farmer in the district to keep a good boar. The best, in my opinion, is a cross between the Berkshire and Poland China. This gives a good streaky bacon. Home-cured hams and bacon, if properly done, compare very favorably with factory cured. After having killed the pig and thoroughly cleaned it both outside and inside, allow it to thoroughly cool down (pigs for curing should never be killed in warm or muggy weather). After it has thoroughly cooled, cut it into such pieces as desired, viz., the hams, the shoulders, and the bacon. The bacon should always be boned. Then give it a good rubbing with dry salt, using about 14lbs. of salt and 6ozs. of saltpetre to about 200lbs. of meat. After having done this place it in a pickling cask or tub, taking the greatest care to protect it from flies. Examine and turn it every week. Leave it in this for at least four weeks, according to the size of the hams. Then take them out, give them a good rubbing with dry salt, using about 14lbs. of salt and 6ozs. of saltpetre, dry them, and strew a little pepper over them, and hang them to smoke. The bacons are better spiced and rolled before being smoked. A smoke house can easily be made with either four or six sheets of 9ft. iron."

Moonta, August 20.

(Average annual rainfall, 15·22in.)

PRESENT.—Messrs. A. B. Fergusson (chair), W. F. Ortloff, W. J. Brinkworth, P. Ford, J. Lawry, and four visitors.

HARVESTING AND MARKETING WHEAT.—Mr. A. B. Fergusson read a paper in which he said—"While the farmer is busy seeking, by improved methods, to get the very best results from the land, the mechanic is also endeavoring to place some machine on the market that will assist him. During the last decade we have made wonderful advancement in this respect since the advent of the complete harvester and the motor winnower, the

Perkin's bag lifter, and the Chapman bag. Wheat harvest work has been greatly facilitated. The first essential in this connection is to see that the machines, whether they be harvesters or strippers, are in a state of thorough repair. Estimate the number of bags required, and have at least two-thirds of them spread out in the sun two weeks before they are used. Bags green out of the bale never fill well and they are hard to sew, and if left standing become slack. Much damage and loss occurs by reaping green wheat. There is much more danger of this since the harvester has been so largely used. We are liable to think that once the wheat is in the buyer's stack it is finished with, as far as we are concerned; but this is a mistake, if that wheat should be stacked green it will probably go musty and weevil will develop. It is our duty to see that our wheat goes into the market in the very best condition. It is well to have a system of standing the bags of wheat in the field. I have noticed a lot of waste, both of wheat and time, through badly placed heaps. Bags fall over, and the person responsible for sewing hardly knows where to start; bags are leaning all ways. The best way is to place three in a row, stand the first three bags so that they will serve as a block on which to lean the others. They can be sown from each end and stood back, and when finished a space is left in the centre to work the loader. When stood in a round heap, which is a common practice, the bags lean all ways, and when sewing is finished bags are standing around in all directions. This is only a detail, but it counts for a good deal when every moment of time is precious. As to the best and most effective machinery, this is a question that every individual farmer must settle for himself, using that machine which he finds suits his conditions and circumstances best. I am a strong advocate of the harvester, and have worked it for 10 years. To go back to the stripper, I would at least want the price of the cleaning as a premium, as I have proved by actual experiment that the harvester gathers more wheat per acre. It must be admitted that our system of marketing wheat is antiquated, slow, and expensive. Of course the elevator system is a big undertaking for any country, but once established is most economical. If it pays in America, why will it not pay in South Australia, which is becoming more and more a wheat-producing country? It has been stated that Canada can place her wheat harvest on the world's market for at least 6d. or 9d. a bushel less than Australia. Thousands of pounds have been paid this year for bags alone. It is a crying shame that farmers should have to pay as high as 7d. and 8d. for a bag, and in a week's time practically give it away to the merchant, who requires it as much as he does; not only that, but the bags that he has given away are actually brought back in 12 months' time and sold to him again at the rate of 5s. a dozen. In an up-to-date wheat yard scales should have no place. Weighbridges, such as are largely used in New South Wales and Victoria, are quick and satisfactory. In New South Wales the Government will put a weighbridge down at any station where 10,000 bags or more are received. These bridges can be put in at a cost of from £60 to £100. The Secretary to the Advisory Board stated that over 100 stations in South Australia received over 10,000 bags in 1910, showing that at least 100 weighbridges were wanted, one especially at Moonta. In the present system of marketing wheat there is no encouragement given to the man who produces and brings to market a clean sample. One can bring in wheat good enough for seed, and another can bring in something a little better than pigs' feed, and they both get the same price. Both are termed f.a.q.—f.a.q. may be a standard for marketing purposes, but it is a farce as far as securing a good sample of wheat is concerned. Professor Lowrie has said the f.a.q. system is not one on which we can congratulate ourselves. and further contends that we are shipping 8,000 to 10,000 tons of rubbish to England every year, and paying 1s. a bushel freight on it, and lowering the name which our wheat holds in the world's market. I consider wheat agents are given too much latitude in receiving wheat that is not f.a.q. They could not accept some lots were it not for the fact that a great deal of the wheat they receive is above standard. Therefore one man has to grow clean wheat to make up for the dirty sample of the other, and gets nothing for it. If producers have the very best interests of the industry at heart they will see that they are bringing to market the cleanest possible sample, in spite of the fact that they get no direct encouragement. Let them take a broader view of it, and seek to keep South Australian wheat at the head of the world's market. Barley in the wheat sample is one thing we must pay attention to. Buyers this season are complaining of it, and rightly so too. The only way of getting rid of it is to weed it out of our seed wheat when it is green. Fixing the standard is another point that is not altogether satisfactory. This season especially the standard was fixed too low, and it has been estimated that we have made the English miller a present of at least 2lbs. to the bushel. If the rubbish were kept out of our wheat the standard could be made much higher. It is fixed on early-maturing wheats from early districts, which are not always as plump as slower and later-maturing wheats in later districts. Sooner or later the elevator system will come ; and the sooner the better, for then we will have a perfect system of grading the wheat. The rubbish that now finds its way into the market will be kept on our own shore instead of being shipped to England and other markets. For the present let us see that as far as possible we keep it at home for pig and poultry feed."

WESTERN DISTRICT.

Butler, September 4.

(Average annual rainfall, 16·61in.)

Present.—Messrs. J. G. S. Morgan (chair), R. W. Phillis, A. Tilly, A. J. Hughes, D. R. Butler, S. M. Bowden, R. Harrowfield, J. C. Humphris, C. F. Jericho, G. Young (Hon. Sec.), and five visitors.

Homestead Meeting.—Members took the opportunity of visiting the holding of Mr. C. F. Jericho. The smithy, stables, enginehouse, stock, and crops were inspected, and the host demonstrated a method of making rope from binder twine. Vines, seven years old, were doing well, but had not yet fruited. A crop, which was cross-drilled with ¾bush. of seed and 1cwt. of super. each way, was looking well. Many ingenious and labor-saving conveniences were noticed in the homestead.

House-Building.—In a paper under this title, Mr. C. F. Jericho advised intending house builders to give careful consideration to comfort before commencing. He preferred a centre passage, leading off into each room, which should possess a fireplace. The kitchen should be large and airy, with the dining-room adjacent, and connected by a door. The roof should be gabled, and the windows protected by a verandah. Outside woodwork required frequent painting.

Coorabie, August 16.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. C. T. Giles (chair), D. Riddle, J. Murray, N. Roberts, W. H. Wheadon, V. Kingsley, C. Hobbs, C. A. Fox, E. Oats, W. Grivell, G. Menzel, A. Riddle, F. Gurney, W. G. Wheadon, F. Underwood, R. Muegge, G. Cabot, H. Coppins, H. Hobbs (Hon. Sec.), and six visitors.

Treatment of Mares and Foals.—The following paper was read by the Chairman :—"Almost the most important item for the farmer to consider in horse breeding is the selection of the mares from which stock is to be raised. Like produces like, and this applies equally to the dam as to the sire. Most farmers are more or less careful in their selection of a sire, but strange to say a great many will put any and every mare they have, irrespective of size or type, to a stallion, and feel disappointed if the resultant stock is weedy. Some farmers make a practice of breeding from a proportion of their mares every other year, under the impression that a foal every year is too much for the mare ; with this I do not agree. I consider the best policy is to select a few of the very best mares, say two or three, and breed from them every year In this way the farmer is breeding the best possible stock from the material he has, and another point is that the mare with a foal is more easily stinted than a dry one. Patronise the best sire available. It is a mistake to spend time and money breeding inferior stock, which requires just as much attention as the best. Experience very soon proves that a mare is not necessarily in foal because she has been served. The disappearance of heat or horseing is the only indication for some time, and even this is not a sure sign, as mares are sometimes known to repeatedly refuse the sire and yet not be in foal. If the mare is in foal she will after a while get sluggish, work steadier than usual, and improve in condition. After about the sixth month visible signs of her condition will be noticeable. Up to this time make no difference in the work given the mare; but after this, which in this district is after the wheat carting is done, she should have lighter work and less of it, and care should now be taken not to drive fast or to give her cause to strain herself. As a rule I never work the mare after seeding, say the end of June, unless she is very fat, which is seldom in this district; but a hard and fast rule cannot be laid down, as a steady worker can be worked with safety much nearer the time of foaling than one that is hot-headed or inclined to 'rip.' Mares should not be given any shaft work within three months of the time of foaling. They carry their foals about 11 months, although the dropping of the first foal is often a little prolonged. My experience is that a filly foal is born almost to the day, and if the mare goes over her time the foal proves to be a colt. At the actual time of foaling the swelling of the udder indicates the coming event, and then a whitish colored discharge, or wax as it is called, appears on the teats. The mares should be put into a separate paddock, but not out of sight of the other loose horses. If not separated from the rest they are often interfered with. If a spare feed paddock is not available, put the mare on the crop in a wheat paddock ; it will do her good and will not hurt the wheat. From the time the wax appears on the teats a watch should be kept on the mare, but she should not be interfered with in any way unless it seems absolutely necessary. If the foaling goes all right the foal will soon be on his legs and trying to suck the mare: and here a little time is well spent watching her, particularly if a first foal, as some young mares are fidgety and will not let the foal suck. In such a case she must be held and the foal given a little assistance, and after once it has sucked there is seldom any trouble in this respect. If the foal is sucking and the mare is quiet, leave them entirely alone, as the mare wants a rest after the exertion of foaling. Before turning them out with the other horses let them first become acquainted while there is still a fence between them. The horses will satisfy their curiosity about the new arrival, and the fence will prevent any damage. This precaution is more necessary in the case of the first foal of the season than with the later ones. If the foal is a healthy one it will thrive and grow quickly and will be a general favorite with the mob. I do not make a practice of working the mare until harvest time, and then for half-days only. The foal should be shut up in a loose box while the mare is away. He will perhaps fret a bit the first day or two, but he soon gets used to it and will be quite contented and quiet as long as the mare is out of sight. It may be necessary to entice the foal into the loose box by leading the mare in for a time or two, but the foal soon gets to know what is expected, and can be driven in quite easily. It is not necessary to have separate stalls or boxes for the mares and foals; it may be better, but I have never found the foal come to any harm running loose and feeding with the other horses. On the other hand, the other horses generally take a fancy to the foal and will let it feed out of the same manger. I have seen animals that are very spiteful to all other horses willingly let a foal push up alongside and share their food. Foals should be weaned when 6 months old, and, provided there is plenty of feed, both foal and mare do better. It is a good plan to teach the foal to tie up while it is about the stable, and once used to being tied it never forgets. Handling the foal will not do any harm so long as it is not played with and teased. Kindness will be rewarded later on and the horse will remember its kind handling as a foal when the time comes to break it in." Mr. D. Riddle would work the mare up to within a few days of foaling, provided she was steady; rough and breeching work, however, was to be avoided. Mr. Menzel would give chain work to every mare that seemed over fat. Mr. Oats agreed. Members were unanimously of the opinion that it was better to give mares expected to foal a free run, rather than keeping them in a small yard.

Farm Wagons.—Mr. G. Menzel contributed a paper on this subject. The English wagon, he said, was the most suitable for general use in this district. It should be about 30cwts. in weight, made of well-seasoned timber, the back wheels 4ft. 9in. in height, and the fore wheels 4ft. 3in., with 13in. boxes, and 3in. axles. The length of the axle from collar to collar should be 5ft. 9½in., width of tyres 5½in. ; the fore wheels having 14 spokes and the hind 16. The axle bed and body bearer should be of 6in. x 6in. stringybark. The body should be about 12ft. 6in. long and 4ft. 10in. wide, which would leave a space of about 6in. clear between the side and the wheels. The height of the side to the inner rail should be about 1ft. 6in., to the outer rail 1ft. 9in. If the height of the front were 4in. greater than the back it would bear the weight of the load more to the centre. Draw bars were more satisfactory than having the pull on to the shafts; the bars should be fixed to the caps on the outside of the wheels. Several members thought a wagon of the dimensions mentioned too large for a farm. Mr. W. H. Wheadon preferred light hind wheels. Mr. D. Riddle favored the table top. A straight bar from the box axle to the bottom of the king bolt would be an improvement on most wagons. The Chairman thought it important to have the ends of the shafts shod.

Miltalie, August 16.

(Average annual rainfall, 14·55in.)

PRESENT.—Messrs. T. A. Wilson (chair), J. P. and I. W. Story, H. Brine, J. S. Jacobs, W. G. Smith, C. and A. Degner, P. G. Wilson, E. Story (Hon. Sec.), and four visitors.

THE AGRICULTURAL BUREAU.—In a paper under this heading, the Chairman pointed out that in the scattered districts where the carrying on of a literary society was impracticable, the Agricultural Bureau was of considerable value from an educational standpoint. He suggested that each Branch should formulate a set of rules for the regulation of meetings. Homestead meetings and experimental work were matters that should have their place in connection with the Bureau, and a library would be found of considerable benefit. Members generally agreed that homestead meetings were of value.

Miltalie, September 13.

(Average annual rainfall, 14·55in.)

PRESENT.—Messrs. P. G. Wilson (chair), C. and A. Degner, J. P. Story, H. Brine, H. R. Jacobs, C. E. and S. R. Searle, M. H. Wilson, W. G. Smith, E. Story (Hon. Sec.), and nine visitors.

FARM MANAGEMENT.—In a paper on this subject, Mr. C. Degner said that the more land was worked in this district the better chance there was of favorable returns. Horses should be fed and watered regularly, and provided with good stable accommodation, each having a stall to himself. It was a good plan to breed a few foals each year to supply any vacancies in the team. There was less likelihood of trouble with sore shoulders if the animals were groomed regularly. The harness of each should be in its particular stall, and should be oiled once or twice a year, and kept in good repair. Attention should be given to the fences, and where barbed wire was used, care should be taken that none of it was left lying about loose. Cocky chaff mixed with crushed oats and wheat made a good horse feed, and hay and straw should be kept as a fall back in case the season failed. A few cows, pigs, and poultry could well be included in the farm stock. In discussing the subject, Mr. J. P. Story agreed that a great deal of working was necessary for the land in this district. Sheep, he thought, were a great help to the farmer. Mr. S. R. Searle advised the keeping of cocky chaff, and thought oats a better feed for horses than wheat. Mr. W. E. Hier did not approve of single stalls for horses. The Chairman, Messrs R. Smith, W. G. Smith, and F. Turner (a visitor) also took part in the discussion.

Roberts and Verran, September 16.

PRESENT.—Messrs. R. Johnson (chair), F. Masters, A. T. Cowley, W. Kunst, C. Kunst, C. Reiman, F. Imhoff, A. J. Buttfield, W. Sharman (Hon. Sec.), and one visitor.

FARMING NEW MALLEE LAND.—In a paper on this subject Mr. W. Kunst said that for clearing heavy timber logging would be found the best method, but with light scrub the use of the roller with knives was most satisfactory. The work should be done as early as possible to give the shoots a chance to grow before the scrub was burnt. He would only cut the springbacks in an area of about five chains wide around the land being cleared. This would give the fire a good start, and it would be found that sticks left standing after the fire had gone through the balance would be more easy to knock down than the springbacks would be to cut. Before burning he would throw in a break about half a chain wide. About the middle of March was early enough for burning. This would leave time for treating any pieces that the fire missed. He recommended working the land to a depth of 1½in. to 2in. with a skim plough or a tine cultivator as soon as possible after the fire had gone through. For later wheats about 45lbs. of seed per acre should be sown, but for the early varieties it was advisable to put in 1bush. to the acre. Usually 56lbs. of super. would be sufficient, but if the seeding were late more would be required. As a rule crops in this district were not thick enough to enable the harvester to do good work, and where the stripper was used there was the additional advantage of the cocky chaff being saved. On the completion of the harvest the fire rake should be put into the stubble. In discussing the subject Mr. Masters said he would use the plough in preference to the cultivator, as the former turned in ashes and other substances that helped to strengthen the crop. He thought the harvester the best method of gathering grain. Mr. Cowley preferred rolling the crop before harvesting, as the shoots would then have started by burning time, and they would be more severely checked by the fire, Mr. Imhoff favored rolling after harvesting, and would use 56lbs. of super. if sowing early in the year, but 50lbs. when seeding late. In the first year he would put in a bushel of seed to the acre, thus securing a better stubble for burning. The Hon. Secretary favored using 45lbs. of wheat and 56lbs. of manure to the acre. Mr. Johnson said that in taking up a new farm the landholder was well advised to sow an area with about a bushel of oats to the acre and about 45lbs. of wheat. He preferred the skim plough, and thought it best to cut as many springbacks as possible. Members generally agreed with the recommendations of the writer of the paper.

Utera Plains, September 13.

(Average annual rainfall, 12·06in.)

Present.—Messrs. Guidera (chair), J. and M. Abrook, W. Gale, H. and G. Hornhardt, G. and H. Barber, W. Lee, jun., H. Warner, and A. Ramsey (Hon. Sec.).

Papers from "Journal."—Three papers from the *Journal of Agriculture* were read by Messrs. W. Lee, Guidera, and G. Hornhardt. With regard to co-operation, members were of the opinion that this would be satisfactory where men of sufficient business knowledge were secured to control the operations, and it was realised that loyal support was a most important factor. Various members recommended different methods of handling young horses.

Yadnarie, September 13.

(Average annual rainfall, 14·09in.)

Present.—Messrs. W. L. Brown (chair), J. A. and E. C. Kruger, G. A. Dreckow, A. Sprigg, A. A. Jericho, R. H. Parbs, F. H. Stubing, B. B. Crosby, J. J. Deer, F. G. Fitzgerald, R. B. Deer (Hon. Sec.), and nine visitors.

Spring v. Bridle Ploughs.—Mr. F. H. Stubing read a paper on this subject. The spring draught release ploughs, he said, were best for use in stumpy and stony country. If a bridle plough were being worked up hill with the full draught and a stump were encountered the shoulders of the horses would be jarred, and in all probability sores would be the result. When this implement was being taken down hill, very frequently it would run on owing to its own weight, the ploughs being worked with the points of the shares only scratching the surface. None of these difficulties would be met in the spring draught plough. Members were strongly in favor of the use of bridles on ploughs in level country, as more stumps were dragged out of the land and less trouble was encountered with the implements. In hilly country the spring draught plough took the ground better and rode more easily over the stumps.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Claypan Bore, September 5.

(Average annual rainfall, 16in. to 17in.)

Present.—Messrs. J. Gray (chair), S. Gray, H. and H. Colwill, J. Northey, C. Dunstone, M. Robinson. C. H. Russell, J. Dudley, F. S. Tall (Hon. Sec.), and five visitors.

Cost of Wheat Production.—Mr. J. Northey supplied the following estimate of the cost of growing wheat in mallee country. The estimate was based on the case of a person working 500 acres. One bushel of wheat per acre, 3s.; 75lbs. of super. per acre, 3s.; wages and keep of one man for 12 months, and an extra hand at harvest time, 5s. per acre; 5 per cent. depreciation of stock, plant, &c., consisting of 12 horses, harness, two harvesters, wagon, binder, plough, cultivator, drill, and harrows, 1s. 6d.; hay, cornsacks, pickle, twine, &c., 4s. 6d.; a total of 17s. per acre. Mr. Gray said the first and second crops

were the cheapest to grow. With a good burn the land could be worked with a tine cultivator as efficiently as with a plough. The cost of rolling and clearing should not be charged against the first crop, but treated as an improvement. Mr. L. McCormick (a visitor) mentioned that it was necessary to take into consideration interest on the land value, and members agreed that with an allowance of about 2s. per acre for this, the estimate of the writer of the paper was correct.

Coomandook, September 20.

(Average annual rainfall, 18·01in.)

PRESENT.—Messrs. Ninnes (chair), Legallez, Lubcke, Driscoll, A., R. A., and L. A. Williams, Luxmore, Hillman, Hughes, Blucher, Cordes, M. Wilkin, C. Wilkin (Hon. Sec.).

FARMING IN MALLEE LAND.—Mr. M. Wilkin read the following paper:—"The most suitable time for starting a farm in mallee land is about the beginning of July. This gives time, with the help of a man, to prepare for a crop the following year. Two weighty young horses of active stamp and a tipdray are necessary for carting. The first thing is to make provision for water. This is most important, as no farmer can prosper who has to cart it. A well or a bore is best, but where good water is not obtainable in this manner a cement tank with a large catchment should be put down; £50 spent on this is not too much. A hut to live in and a stable come next. With one's own labor those can be erected very cheaply. In a district where stone is available nothing else should be used for the walls. Structures of this substance are far more weather-proof and add much to the value of the property. The timber and iron for roofing can be purchased for about £40. The hut should be roomy, so that afterwards it can be utilised for a barn or storeroom. The stable should have accommodation for six horses. with chaffroom attached, and be built so that it can be enlarged at any time if necessary. About the beginning of October four more horses of the same stamp as the others will be needed for scrub-rolling; a roller can be built for £10, and 400 acres should be rolled by the end of November. Wheat always grows better after early rolling. When this is done the place could be left for three months. Being harvest time, a man with a good team should be able to earn £60. After burning the rolled scrub about the end of February one could plough up about 20 acres of good soil and sow with barley or rye. This would come up with the first rains and save a considerable amount of horse feed. A cultivator should be put over 300 acres as early as possible to prevent ashes drifting. About the middle of April drilling could be started and finished by the end of May. The remaining 80 acres of cleared land could be fallowed and cross-ploughed during the next two months. By doing this a considerable amount of roots would be torn out and a good hay crop ensured for the following season. As soon as the fallowing is finished the horses should be paddocked to keep the chaff bill down. It will be necessary to fence the crop to prevent stray stock trespassing. A wooden post every chain and one tee iron between each with two barb wires can be erected for £40. All posts should have six holes bored in them. so that extra wires can be added at any time with very little trouble. At least 50 acres should be cut for hay. In a fair season this should return about 25 tons; 8bush. of wheat could be expected. All stubble should be burned, and the land ploughed as soon as possible and sown again. If cropped three times in succession and stubble burned each year, practically all the roots would be killed. Expenses for the first 18 months would be—Horses, £150; water, £50; hut and stable, £40; dray, £20; roller, £10; seed and super., £60; seed drill, £50; plough and cultivator, £60; fencing, £40; horse feed, £50; harness, £15; tools and breakages, £20; living expenses, £40; wages, £40; binder, £38; stripper, £65; winnower, £28; total, £776; against sale of wheat, £262 10s.; money earned, £60; total, £322 10s. To start farming on this scale a man would require a capital of £585. Of course a good deal could be saved by buying second-hand implements, but to do this successfully one must have a thorough knowledge of machinery. I would warn anyone against the time-payment system, because one always pays at least 12 per cent. for the accommodation, and if dry seasons are experienced it is often difficult to meet the payments. By putting substantial improvements instead of the temporary ones usually erected to save time, one can always get assistance from the Government if needed, should there be a failure in the crops." **Members thought a 20,000gall. cement tank large enough for the purpose mentioned by the writer of the paper. After a clean scrub burn if a cultivator were taken round the plot, and strips worked with this implement, drifting would be checked to a large extent. A skim plough could take the place of the plough and cultivator during the first year.**

Coonalpyn, September 19.

(Average annual rainfall, 17·49in.)

PRESENT.—Messrs. H. Bone (chair), J. Hill, G. H. Wall, R. F. Venning, J. J. Cronin, A. H. Fidge, D. T. Cronin, F. J. Tregenza, J. F. Pitman, J. Angel, G. E. Venning (Hon. Sec.), and 11 visitors.

SPRING WORK IN THE GARDEN.—In a paper under this heading, Mr. J. F. Pitman said orchard land should be harrowed and then cultivated with a spring tooth implement in the spring, to kill weeds and assist in the conservation of moisture. Apricots, plums, and especially peaches should be thinned, if necessary, to ensure a good sample of fruit. Apples and other pip fruits should be sprayed against codlin moth, and grafting and budding should receive attention. It was advisable to work the land after every rain of consequence that fell prior to Christmas. In reply to questions, Mr. Pitman said he preferred budding to grafting. This work should be done in the spring, and he strongly advised pruning young trees. Almonds, which had not borne fruit, should be budded, as they seldom fruited unless this were done. No harm would result if vegetables were grown for three or four years between young stone fruits.

Forster, August 23.

(Average annual rainfall, 10in. to 11in.)

PRESENT.—Messrs. J. G. Whitfield (chair). W. J. and T. Searle, W. J. and F. Johns, R. Whitfield, R. Copp, P. Purdie, J. Stone, C. Hayman, E. Towill, and C. Payne (Hon. Sec.).

SEEDING OPERATIONS.—In a paper on this subject, Mr. R. Whitfield recommended the use of the four to eight furrow plough, according to the available strength. The land should be broken to a depth of about 4in., harrowed in the same direction, the seed being drilled in the opposite way. The width of the drill should not exceed 17 discs. After this the harrows should again go over the land. The stripper was better for use in sandy and stumpy land, but under suitable conditions the harvester was a decided improvement. Members generally agreed.

HORSES.—Members generally were of the opinion that the practice of purchasing old horses for use on farms was to be deprecated.

Monteith, September 26.

(Average annual rainfall, 14in. to 15in.)

PRESENT.—Messrs. T. S. Bradford (chair), R. Magor, J. Ferries, W. G. Gunn, H. Gardner, O. E. Male, C. J. Morris, T. R. Smith, A. A. Wells, J. Rowan, A. Clark, W. H. Carter, W. S. T. McCulloch, W. J. McCulloch, J. F. Connell, L. Bell, A. P. Mount-Stevens, D. McDonald, C. A. Bentley (Hon. Sec.), and a few visitors.

CO-OPERATIVE CHEESE FACTORY.—The Hon. Secretary delivered an address, in which he urged the erection of a co-operative cheese factory in the Monteith district. He gave interesting details with regard to the general working of such a scheme, and mentioned that a city produce firm had expressed their willingness to assist in the undertaking.

Pinnaroo, September 20.

(Average annual rainfall, 16·74in.)

PRESENT.—Messrs. Roy Edwards (chair), A. U. Burman, F. G. Bonnin, L. M. Ferguson, Geo. Fuller, F. Laycock, B. H. Nash, A. I. Reed, T. B. Shiels, H. Venning, W. Wilson, and P. H. Jones.

ENSILAGE.—Mr. L. M. Ferguson supplied a paper on this head. The writer based his remarks on practical experience, both in Victoria and South Australia. He agreed that it was somewhat early for this district to resort to such a method for the preserving of fodder; but he was sanguine that the time would come when it would be necessary to combine wheat-growing with the raising of stock. Then it would be advantageous to have reserve feed to tide through a dry autumn or winter. He advocated the cutting of grasses, preferably wheat, oats, or sorghum just prior to its being in a fit state for hay. He would use a pit, timbered at the sides but with the natural earth flooring. It was advisable to keep the grasses well damped as the pit was being filled, and to allow the whole a couple of days for settling down before weighting. A thick layer of straw under the weight prevented the admission of air, and consequently improved the quality of the ensilage. Members generally agreed with the writer in respect to it being rather premature to make ensilage in this district. The Chairman had used chaffed maize, but it was too rich, consequent upon its having been cut on the ripe side. He mixed it with dry hay chaff. He found no disadvantage in the cement pit.

Parilla, September 19.

(Average annual rainfall, 16in. to 17in.)

PRESENT.—Messrs. H. G. Johnson (chair), C. Foule, P. J. Brown, M. Rush, P. Harrip, L. Foule, P. N. Lewis, G. Gregory, J. Lee, M. McAskill, G. Mendorf, S. Evans, A. J. Stevens, J. H. Daniel, Phil Harrip, J. H. Dewhirst (Hon. Sec.), and one visitor.

FALLOWING.—Mr. E. J. Keeley read a paper on this subject. As the land in this district was free from weeds, and several successive crops destroyed large numbers of shoots, he said, fallowing was not considered necessary during the first few years. However, this was now becoming essential. The sooner after seeding the land was ploughed for this purpose the larger was the amount of water it would take in. The weeds also germinated earlier, and could then be destroyed when the land was worked over in the spring. The ploughing should be to a depth of 4in. on the firm soils, but 3in. was sufficient on the sandy land. This rendered it more easy to cultivate the land to different depths. It was inadvisable to fallow stubble, on account of the liability of the crop to be attacked by takeall; the best practice was to fallow every third year. If the soil became hard it might be advisable to go over it lightly before ploughing. The addition of fair dressings of super. to the fallow would encourage a good growth of feed for stock. Mr. Daniel advised working the fallow after every rain. Mr. Gregory thought it necessary to work it in October, and keep the surface loose. Mr. Stevens recommended lightly skimming the land after harvest and ploughing it when seeding. He would fallow to a depth of 3in. the first year.

Waikerie, September 15.

(Average annual rainfall, 8·89in.)

PRESENT.—Messrs. E. J. Burton (chair), F. B. Williams, W. J. Green, S. Modistach, R. Stanley, J. C. Walters, F. G. Rogers, and Jno. J. Odgers (Hon. Sec.).

THE SULTANA.—Mr. W. J. Green read a paper, as follows:—"I have found the Sultana vine with irrigation tends to throw out an abundance of wood, mostly rank, and little fruit. The present style of pruning in my opinion is too severe; there are not enough rods left to carry fruit, four canes to a vigorous vine not being sufficient. The Sultana should have at least six good canes, using a three-wire trellis, the permanent arm to be taken to the second wire, and the rods up and down. The trellis I am using for my young vines is made with this end in view, and consists of three strong posts 7ft. 6in. long, two as strainers and one as a centre post 4ft. 6in. above the ground, with six iron standards between. The first wire is 2ft. from the ground, there being 14in. between the second and third wires. The rods should be taken to the first wire the third year, and during the fourth year taken to the second wire, when the permanent arms should be formed. The third wire is not wanted until the fifth year, when the vine is furnished with plenty of canes. When pruning select short-noded wood, not too thick, and take two good canes for each wire; the length of canes varying according to the strength of the vine. Leave spurs of two eyes in suitable positions for next year's fruit wood. A good setting results from twisting the canes around the wire, taking care that each node cracks when it is being twisted. This causes a slight fracture to the cane and steadies the flow of sap, acting much the same as a cincture on the currant. I have found that the cincture on the sultana causes weak wood, and generally weakens the vine. In spring all buds below the arm should be rubbed off. Reserve all likely shoots on the spurs for next year's canes and rub off those not required. Topping for a second crop is a bad practice, especially on the Sultana, as it tends to weaken the vine. The leaves are the lungs, and by removing these the vine is injured. Grapes exposed to the sun are tough-skinned and inferior in quality as compared with fruit shaded by the foliage, and no light-colored Sultanas can be obtained where there is a lack of this." Mr. Green said the length of rod for a vigorous vine 6 to 8 years old was 4ft. or 5ft. The chief factor with the Sultana was disbudding. Barren buds should be rubbed off. Spurs should be left in a suitable position for wood. Cincturing the canes might be useful. A good average crop was about a ton per acre. Mr. Stanley generally agreed with the writer, but thought he advised too great a length for canes. This year's rods should come from wood that bore fruit last year.

Wilkawatt, September 20.

(Average annual rainfall, 16in. to 17in.)

PRESENT.—Messrs. D. F. Bowman (chair), W. J. and D. Bowman, jun., C. and T. Sorrell, J. and A. V. Ivett, E. W. and H. H. Brooker, T. Sorrell, A. J. McAvaney, F. and B. Spackman, W. R. and M. Neville, F. W. and E. Altus, B. Tylor, W. J. Tylor (Hon. Sec.), and seven visitors.

PIG-KEEPING.—Mr. W. R. Neville read the following paper on this subject:—"This should be looked upon by the farmer as one of his most profitable side lines, and with a reasonable amount of care should pay handsomely. The sheds or sties should be warm, and yet have a maximum of ventilation, and face the north. The floor should be of concrete, or bricked, to allow of thorough cleaning. A good supply of bedding is necessary. The yards (there should be more than one) should be periodically spelled, root crops being grown in those that are not being occupied. In breeding, the boar is the first consideration, and should be purebred and pedigreed, if possible. Avoid inbreeding, as the ill effects of this quickly show in pigs. The Berkshire or Tamworth is recommended, as these are both good doers and vigorous. The sows should not be put to the boar before they are 10 months old, and when in pig should be allowed plenty of exercise to avoid getting too fat. When farrowing, cleanliness should be one of the first points, and care should be taken not to excite the animal, or she may become savage and develop a liking for eating her young. In addition to milk, &c., a liberal supply of greenfeed in the way of lucerne, also mangels and turnips, should be given. The latter can be grown to advantage in the yards not being used by pigs, and will considerably lessen the cost of feeding. The animals can be fed in this way until within a fortnight of being killed, when they can be hardened off with grain, and at the age of 6 to 8 months are ready for the market." Mr. W. J. Bowman favored the Berkshire-Tamworth cross, as they gave the best bacon. Milk and greenfeed, with peas or wheat to finish off, was considered the best ration for fattening.

MARKETING WHEAT.—Mr. F. W. Gasmier contributed a paper, in which he stated that the farmers, under the present system of disposing of their produce, were entirely in the hands of the merchants. This position was due to the union existing amongst merchants throughout the world. London was the centre of the world's market. This was their centre of action, and the producer had no say in settling the prices for their produce. To rectify the position the farmers should unite throughout the world and co-operate through their unions. They should build mills in suitable centres and grind all wheat to first-class flour, instead of shipping the wheat and allowing the labor to be taken from these shores. The flour could be shipped to depôts and there retailed to the consumer without the intervention of the middleman or merchant. It would be necessary to get the bakers to join the union by offering a bonus on their purchases. If these proposals were carried out farmers would in a few years arrange their own prices for their marketable goods.

Wynarka August 29.

PRESENT.—Messrs. J. R. Beck (chair), C. B. Wright, G. G. Pitt, A. W. Laurie, J. Boyce, W. Boyce, W. Sweetman, A. Hood, A. McDonald, G. Masson, C. Schultz, J. Schultz, J. Murphy, M. F. Gates, J. Carlysle, C. S. Hall (Hon. Sec.), and two visitors.

FALLOW.—Mr. W. Boyce read a paper from which the following is taken:—"The object of working the fallows early in the spring is to keep a mulch on the surface and so conserve the moisture in the soil. Mulches act by breaking the connection between the surface soil and that beneath. The more thoroughly this connection is broken the more effective will the mulch be. The plough, by cutting off a layer of surface soil and returning it loosely, makes a more effective mulch than any other implement. Until this has been destroyed by rain and other natural causes, nothing will be gained by working the land and breaking down the rough surface; to do this would be rather a disadvantage; for it will have a tendency to re-unite the soil, thus strengthening its capillarity and increasing the flow of water upwards to the surface to be lost by evaporation. Even if the ploughed surface has become somewhat settled, and therefore less effective, little will be gained by working it in the early spring if it has been a wet season. After dry weather conditions set in the amount of working the fallowed land requires will depend upon the climate

and the condition of the soil. Professor King, of Wisconsin, found as the result of experiment, that in seven weeks the loss of moisture from unmulched ground was equivalent to 170 points of rain more than from mulched land. If the moisture is to be saved the soil must be stirred as soon as the effectiveness of the mulch is destroyed by rain." The majority of members thought the harrows the best implement for working down the fallow.

SOUTH AND HILLS DISTRICT.

Blackwood, September 15.

(Average annual rainfall, 27in. to 29in.)

Present.—Messrs. W. L. Summers (chair), P. H. Williams, Gamble, A. A. Magarey, Eglinton, Sibley, Penno, H. and L. Sullivan, Hilfers, James, Davis, Savage (Hon Sec.), and two visitors.

Principles of Cultivation.—Mr. H. E. Sibley read the following paper:—"The main question we have to consider under this heading is, why do we cultivate? Firstly, to deepen the soil volume within which the main feeding roots of the plants are placed. When we sow a crop we crowd into a limited space a greater number of plants than would grow naturally, thus limiting the surface area within which they are able to grow. Greater depth will give rise to stronger individual plant development. Plants are not always unable to penetrate deeply in untilled land, as roots find their way downwards in fissured or cracked soils, however small these fissures may be; but tillage renders this penetration into the subsoil general and not accidental. Secondly, the growing tips of roots must be able to breathe, and they are unable to do this unless a well-conducted tilth is provided. Thirdly, tillage operations regulate the water supply of the soil, by helping to store up moisture at wet times for the benefit of crops sown at later periods. If the water is in excess, tillage operations spread it evenly and reduce the danger of waterlogging. Loss through evaporation is also reduced. When the rain falls on the hard untilled ground very little penetrates below the surface. The bulk lies on the surface, runs away into creeks, or is evaporated. Quite the reverse happens with loose, broken earth, which acts like a sponge and is capable of absorbing a large quantity of the rainfall. It also transmits it to the subsoil beneath. In a dry country like ours, this may be considered one of the principal objects of tillage operations. The following is taken from a bulletin of the Illinois Agricultural Experiment Station:—'Tillage or cultivation also hastens the liberation of plant food by permitting the air to enter the soil and burn out the organic matter; but it should never be forgotten that tillage is wholly destructive; that it adds nothing whatever to the soil, but always leaves the soil poorer. Tillage should be practised so far as is necessary to prepare a suitable seed bed for root development, and also for the purpose of killing weeds, but more than this is unnecessary and unprofitable in seasons of normal rainfall.' It will be seen from the above that in the humid climate of Illinois, conservation of soil moisture is of so little importance that cultivation is actually condemned beyond strict limits. With our dry climate, on the other hand, conservation of moisture is very essential. This shows how very careful we must be in attempting to apply the cultural experience of other countries to our own conditions, when there is so much difference in climate. When soils are tilled, they are opened out so that air, water, and all the other weathering agents have free access to the individual particles of the soil, and the result is that the minerals on which plants feed are rendered more readily available. Phosphates, potash, and calcium salts become more soluble. Organic matter is broken down and split up into nitrates. Indeed, all processes that contribute towards the fertility of soils are hastened. Finally, tillage has also the effect of destroying undesirable weeds, and thus helping the growth of cultivated plants. *Capillarity.*—Whenever a lamp is lighted, there is at once started a current of oil rising through the many spaces between the threads of the loosely-woven wick, and this flow continues so long as the oil is removed from the upper end by burning. So, too, when a wet soil is exposed to a drying wind, the removal of water from its surface results in setting up a flow from deep in the ground, upward, toward and to the drying surface, to make good these losses. Then, again, when the root of a plant threads its way among the soil grains and withdraws from their surfaces a portion of the water with which they are charged, there are at once set up, to make good this loss, currents of water travelling from various directions in the soil towards the absorbing root. If a clean glass tube ·055in. in diameter is placed upright in a vessel of pure water at a cold temperature, the water will be seen to rise on the inside to a height of 1in. above the surface of the water in the vessel, and the smaller the diameter of the tube is the greater will be the height to which the water will rise in it. In a tube 1in. in diameter the water will rise ·054in., and in a tube ·001in. in diameter the water will rise 4·56in. The molecules in the glass are stronger than those in the water, consequently the water is drawn up the tube. In the soil the small fissures act as the capillary tubes through which the moisture is drawn upward. The different forms of tillage are classed as follows :—(1) Ploughing, (2) harrowing, (3) cultivating, (4) rolling, (5) horse-hoeing. Firstly, we will deal with the plough. If the work of a plough were perfect it would, in principle, reproduce exactly the work done by a spade, *i.e.*, completely turn over a slice of earth. In practice, however, the plough is far from equalling the spade in its work. The soil may, perhaps, be as well loosened, but it never is so effective in completely burying weeds as if the land were dug. The plough is the main implement in use on farms for breaking up land, which is usually ploughed roughly, and the cultivators, harrows, and rollers usually prove sufficient to provide the necessary degree of tilth. There are four types of ploughing—(1) surface, or skim-ploughing ; (2) average depth ploughing ; (3) deep ploughing ; (4) subsoil, or trench ploughing. Of course these are only relative terms. What is deep in one district is shallow in another, and *vice versa.* Generally, however, shallow ploughing varies from 2½in. to 4in. This is used to break up burry land, or where the soil is thin and crusty, and overlies raw subsoil. The bulk of South Australia's fallowing is done on this system, and therefore 4in. must be considered average ploughing. Generally, average ploughing means 6in. to 8in., and is done about every two or three years on land which is shallow ploughed. Deep ploughing is reckoned about 8in. to 10in. This depth is broken in preparing land for special crops, *e.g.*, root crops, or crops that are likely to be in the soil some years, such as lucerne. Subsoiling means 12in. to 18in., and is practically only used in preparing orchards and vineyards. The time to plough requires careful consideration, according to the local conditions prevailing. As a rule the first ploughing should commence as soon as possible after the first good autumn rains, and the more rain the land receives after it is broken up, the better is the store of moisture for the plants or trees, and the quicker and stronger will they grow. Light sandy soils can be ploughed almost at any time, so it is just a question of doing it at the most convenient time to fit in with other work. The character of the implements used in the cultivation of the land has a very important bearing, both on the progress of the work and its ultimate results. That type of land which is stony and rough does not make ploughing with the fixed plough desirable, on account of likely injury to the ploughman and also to the extra cost of breakage of shares. The stump-jump plough, therefore, is in every way preferable. South Australia is the home of this plough, which was invented by a South Australian. Directly the share touches any fixed obstacle, the section carrying it is lifted or jumped clear of the stone or root, after which it returns to its normal position. These ploughs do, as a rule, very good work and are especially adapted for cultivating where any rough, stony, or stumpy land occurs. The conformation of the field is important. Flat or gently undulating ground may be ploughed as desired. Steep fields or orchards require special attention. If the ploughing is straight up and down the field the soil is washed straight down the hill, and also the draught is very heavy. It would appear wiser, then, to have a furrow running along the hill, but even with this method there is a danger of washing when the furrow overflows. The best way is to plough obliquely, and so conduct the waterflow on a gentle slope. The objects of harrowing are as follows :—To drag out weeds incompletely buried by the scarifier or plough. To bury seed which has been broadcasted. To kill weeds just germinated. To bury manure which has been broadcasted. To reduce soil to a fine tilth and consolidate it. The quicker harrowing is done the better it is done as a rule. It is best to harrow in one direction and then cross harrow. If the soil lies in the furrow, the first harrowing should be in the direction of the plough. Cultivation corresponds to light second or third ploughing, but the soil is not turned over. The object is to scrape up the surface which has become consolidated by rain, and also to destroy weeds. It levels down the soil and provides a healthy seed bed, and may even help to cover the seed. There are numerous forms of cultivators, but they are all used for the same purpose. Land is rolled for the following reasons :—To consolidate the land, especially light sandy land, when ploughing has been late and rain scanty. To crush clods when the ground is rough, particularly on heavy land ploughed too dry. On the growing crops to make them stool or tiller. Ordinary cropping land is lightly rolled to prepare the land for harvesting machinery. To bury fine seeds, such as grasses and clovers; there are several forms of rollers, namely, wooden, which is the oldest in use and is very useful for light rolling; iron cylinder, which is usually used for rolling crops; Crosskill clod crusher, which consists of a series of narrow plates fitting loosely to a central axis, and carrying on their surface a series of teeth—these rollers are very heavy, but are exceedingly useful for rough and uneven ground in dry countries; Cambridge roller, which consists of a series of discs or rings with sharp edges—being placed side by side these edges present a corrugated surface and are well suited for rolling crops. The horse-hoe is a small cultivator usually drawn by one horse, and is used mainly for cultivating between the rows of root crops, such as potatoes, mangels, &c., where the rows are about 2ft. or 3ft. apart. The most widely used form of horse-hoe is the Planet Junior. This implement has a lever to regulate the setting of the tines according to the width of the rows. It is exceedingly handy in vineyards, and is generally used during the summer to kill weeds. There is also one other advantage in that it can work quite close to the vines."

Mr. A. A. Magarey also treated with this subject in the following paper:—" Everyone must find by experience what is best suited to his particular soil, and should have a definite reason for every operation in connection with cultivation. It is no uncommon thing to hear a man say he is working on a certain system, for no other reason than that he knows someone else who does it that way; on the other hand, there is the man who will not use a certain method because he gets along all right without it, and never troubles to find out whether he would not do better by altering. The most important reason for cultivation in a dry climate like ours is the conservation of moisture in the soil, to enable the crop to grow through the summer. It allows of the free entrance of air. which is as important to the growth of a plant as moisture. The absorption of moisture from the air by the soil is most important in a dry climate. There is always moisture present in the air in the form of vapour, even in the hottest weather. This fact accounts for the presence of dew. This vapour in the warm air comes into contact, during the night, with the cooled surface of the earth, and condensation results. If the air is allowed a free passage through the surface soil a fair amount of the moisture lost during the day by evaporation will be returned during the night by condensation. A dry, peaty soil will absorb as much as one-twelfth its own weight of moisture in a night in this way, a clay soil not quite so much, and sandy soil least of all. It will be seen, therefore, that the amount of moisture a soil will absorb is dependent upon the amount of vegetable matter and clay it contains' It should be well worked, and humus added either in form of stable or green manure. The deeper it is worked the greater quantity of water will it be able to take in without becoming waterlogged, and the greater amount will it be able to retain, and the better able will it be to chemically decompose new material into plant food. The disadvantages of continual shallow ploughing are that a hard pan is formed. The point of the plough scrapes over this and plasters down the under surface of the soil. In heavy soils this hard pan restricts the free passage of water and air either downwards or upwards. In light sandy soils this does not occur to any extent, and it will be noticed that these soils are generally ploughed deeper than the heavier ones, when the reverse should be the case. As a remedy to this hardening of the under surface of the soil. it is advisable to continually alter the depth to which the ground is ploughed, and every few years it should be ploughed as deep as possible without turning the subsoil to the top. It would also be beneficial to subsoil every 10 years or so where possible, as this helps to drain the land more thoroughly. Also the surface soil gradually mixes with the broken subsoil, which has been acted upon by air, water, and frost, and thereby increases the depth of the soil. The summer working should be very shallow, stirring to the depth of a few inches with a scarifier being quite sufficient. This forms a loose mulch on the surface, and therefore prevents loss of moisture by evaporation, as capillary attraction is not strong in very loose soil. Scarifying kills grass and weeds and thus prevents loss of moisture in this way. It will be found beneficial to run the scarifier over the surface every two or three weeks, whether rain has fallen or not."

Cherry Gardens, September 17.

(Average annual rainfall, 35·03in.)

Present.—Messrs. H. Jacobs (chair), J. Lewis, G. Hicks, C. Ricks, T. Jacobs, sen., J. Tozer, A. Broadbent, H. Lewis, T. Jacobs, jun., H. Jacobs, C. Jacobs, A. R. Stone (Hon. Sec.).

Fencing.—In introducing a discussion on this subject, Mr. J. Tozer recommended pegging out a straight line for the fence so far as possible. The wires would then be much easier to keep tight. Under ordinary conditions stringybark would be found suitable for posts, but where white ants were troublesome, blue, pink, and especially red gum were to be preferred. The posts should be split to a width of 4in. or 5in. at the top and placed between 9ft. and 10ft. apart, and not less than 20in. in the ground. Strainers should be not less than 9in. across the top, of good solid wood, and from 2ft. 9in. to 3ft. in the ground. Struts for the strainers should be placed squarely on the adjoining posts at the butt ends a little below the surface of the ground. To put the strut close to the top of the strainer tended to raise the post out of the ground instead of firming it. The top wire should be about 2in. or 3in. from the top of the post, thus being 3ft. 9in. from the ground. Four No. 8 wires should be placed at equal distances between the top wire and the surface of the ground. Mr. Ricks thought it advisable to have two barbed wires in a fence.

Forest Range, September 11.

(Average annual rainfall, 35in. to 36in.)

PRESENT.—Messrs. W. McLaren (chair), J. Vickers, J., H., A., F., and E. Green, H. Schultze, F. and E. Rowley, H. Sass, H. Waters, J. Coulter, R. Collins, and O. S. Pollard (Hon. Sec.).

FUSICLADIUM.—Mr. E. Rowley mentioned that he had tried both limewater and Bordeaux mixture for spraying apples affected with this disease, but had noticed no difference in the results. Mr. J. Green favored Burgundy mixture, and Mr. Vickers would use soda in preference to lime, as it had not such an injurious effect on the spray pump.

Gumeracha, August 19.

(Average annual rainfall, 33·30in.)

PRESENT.—Messrs. A. Moore (chair), D. Hanna, J. Monfries, J. B. Randell, B. Cornish, H. V. Cornish, H. W. Norsworthy, W. B. Randell (Hon. Sec.), and one visitor.

HISTORY OF THE GUMERACHA BRANCH.—A paper on this subject, of considerable local interest, was read by Mr. D. Hanna. He mentioned that the inaugural meeting was held on the 9th July, 1888, thus this was the fourth Branch of the organisation formed. The apple export trade in its very early stages had received practical encouragement from the Branch. Many agricultural practices now in general use were originally introduced into the district through the agency of the Bureau. Since the first gathering, 184 meetings have been held, 84 papers on agricultural matters being read by members. The paper was much appreciated, and eulogistic reference was made to the excellent work done by the writer during his 25 years' membership, and also to that of Mr. W. Green.

HEREDITY.—At a previous meeting, Mr. J. Porter read a paper under this heading, in which he said—" Very few men to-day wishing to breed a horse for any particular purpose would choose a sire possessing none of the characteristics desired, but would secure one with the qualities required in as marked a degree as possible. It is not so long ago when any horse, if a low price were asked for his service, was very much in demand. The men who made use of the animal thought that by getting cheap foals they were doing best. It is satisfactory to know that this state of things is fast passing away. By studying the subject a little more closely, however, I think much better results can be obtained. It is not so much to the breeding of stock as to plant life that I wish to direct attention. If we recognise the fact that like produces like, or that plants as well as animals have the power of transmitting characteristics, we shall be more careful in the selection of the seed we use. Numbers of farmers now use the grader with good results, but it would not be wasted time or trouble if they were to carefully select seed from the most healthy and prolific plants only. One who looks closely at a growing crop will notice that some plants are much stronger and healthier than others growing beside them. It may be said that the more vigorous plants have had a more abundant supply of plant food, but I am inclined to think that if the seed of the more vigorous plants were gathered and planted side by side with seed taken from the weaker ones we would find that the seed of the strong plant would produce the better crop. Up-to-date nurserymen advertise trees propagated from proved fruiting trees only, and it is the general practice of the gardener to keep the best plants for seed. The increased cost of production makes it necessary to get the best possible return for our labor and outlay, and if the returns can be increased by careful selection, it will be well worth our time and trouble to give it a trial." Mr. J. B. Randell mentioned that scions taken from fruiting and prolific trees came into bearing much earlier, and bore much better than others; the same principle held with regard to saving seed from early and prolific cereals and vegetables. Seymour attributed the running out of potatoes to the practice of planting small, rubbishy tubers, instead of selecting seed from large sets. Mr. H. V. Cornish agreed. Mr. D. Hanna believed it paid to breed from the best. Members generally supported the idea of the writer of the paper.

Inman Valley, August 13.

(Average annual rainfall, 26in. to 27in.)

PRESENT.—Messrs. H. J. Meyer (chair), J. W. Crompton, H. G. Allert, H. J. Jagger, H. J. Dennis, H. Gray, H. I., H. T., and R. J. Martin, D. A. Nosworthy, H. Mitchell, J. A. Lee, V. G. Tugwell, M. J. Meyer, J. G. Barratt, R. A. Mayfield, E. A. Scarfe, J. Millard, G. and A. McCoy, L. V. Hurrell, H. M. Parsons (Hon. Sec.), and one visitor.

WATTLE CULTIVATION.—In a paper on this subject, Mr. R. J. Martin said wattles could be grown to a fair size on almost any scrub land, if not planted too thickly. The land should be roughly ploughed twice with a stump jump implement before the wattles were planted. This killed most of the natural scrub, and minimised the risk of bush fires. Three or four pounds of seed boiled for a few moments should be sown to the acre, the harrows being then put over the ground. If the nature of the land was too rough for ploughing, good results might be secured by using a grubber, or the dry seed might be scattered through the scrub, which should then be burnt. The falling price of wattle bark, however, did not warrant very careful cultivation. In discussing the subject, most members agreed that it did not pay to cultivate the wattle on land that would grow feed for sheep, as the price received for bark was not sufficient to pay the cost of stripping, carting, &c., and return a profit.

SHEEP DOG TRIAL.—On the motion of Mr. H. J. Dennis, seconded by Mr. D. A. Nosworthy, it was decided to hold a trial of sheep dogs under the auspices of the Branch, and the following committee was appointed to make arrangements, *i.e.*, Messrs. H. J. Jagger, H. J. Dennis, J. W. Crompton, H. T. Martin, H. J. Meyer, and the Hon. Secretary.

Kanmantoo, September 13.

(Average annual rainfall, 17·90in.)

PRESENT.—Messrs. R. Downing (chair), A. Stewart, R. Critchley, H. Downing, E. Shepherd, W. C. Mills, S. C. Downing, A. Mills, H. R. Shepherd (Hon. Sec.), and two visitors.

DESTRUCTION OF RABBITS.—In a paper under this heading, Mr. E. Shepherd stated that if systematic and simultaneous efforts were made to cope with this pest, a great deal more good would be done than by the haphazard methods at present in vogue. He recommended poisoning as soon as the grass became dry, either by using a poison cart or by putting down a plough furrow and in this placing a number of baits of different poisons. When the ground became wet, trapping and digging out should be resorted to. Stones should be rammed into rock holes. Wire netting was of greatest value where the country was not too rough, 3ft. 6in., 1¼in. mesh netting being used. The paddocks enclosed in this way should not be larger than 500 or 600 acres.

Longwood, August 16.

(Average annual rainfall, 37in. to 38in.)

PRESENT.—Messrs. W. H. Hughes, A. F. Furniss, H. Winter, J. C. Blakley, E. Colbey, J. Brown, E. A. Glyde, J. Roebuck, E. J. Oinn, W. G. Doley, T. Hill, J. R. Coles (Hon. Sec.), and four visitors.

EARLY CULTIVATION IN ORCHARDS.—In the orchard of Mr. A. F. Furniss, at whose homestead the meeting was held, it was noticed that Clairgeau pears were blossoming, and that ploughing amongst the trees was almost completed. Members who favored the practice of ploughing early, *i.e.*, before August, maintained that with the possibility of dry seasons, it was very beneficial, and if cultivation were carried on throughout the season the weeds would be kept well under control. On the other hand, it was contended that the land was apt to become puddled, and washing was encouraged. Frequently the weeds were started, but owing to the continued wet, it was difficult to get on to the ground, and they became too strong to be dealt with by the scarifier. October ploughing enabled the weeds to be turned under, and the soil was left in good condition for aeration.

Onion Growing.—The following paper was read by Mr. J. Roebuck :—" In this district, where the holdings are small and the late frosts often destroy or damage crops such as potatoes, beans, tomatoes, &c., onions are being more extensively grown each year, as they are considered a safer crop. When selecting onions from which to grow seed, first decide whether the onions are for late keeping or for marketing straight off the land. The hard keeping sorts do not crop nearly so heavily, and they are not so juicy and mild in flavor. Further, the plants are more difficult to raise in this cold and wet district than the softer sorts, which will not keep long. It is a good practice to grow both an early and a late sort. The seeds must be grown a good distance apart, as they readily hybridise. Select sound, fair sized bulbs of good color, firm right up to the neck, which should be small. Plant them in rows 2ft. apart, the bulbs being 1ft. apart in the rows. Bury the bulb, leaving the neck out of the ground. Not more than three or four rows should be planted in one patch, or they will be found difficult to hoe and keep clean when the seed stalks are grown. Plant keeping sorts in July. Soft sorts will have to be planted earlier, as they will have started to grow. The ground should be well manured and deeply dug. Cut off the seed heads when the black seeds begin to show. Spread them on sheets of iron to dry, and then thrash them out ready for sowing. New seed will germinate quicker and grow stronger than one year old seed ; after two years it is not much good. The most difficult part of onion cultivation here is raising the plants, as they have to grow through the cold winter months. Select a warm sunny slope if possible for the seed beds. A well drained sandy loam is best. Dig in a good dressing of stable manure early in March. Then put another dressing of short stable manure on and hoe it in. This keeps the surface loose and gives the young plants a good chance to break through the ground. Give it a good watering, if possible, to start the weeds before the second week in April, when the first onion seed should be sown. If they are sown earlier they may run to seed when planted out. Sow at two or three different times, about a week apart, or all the plants may be ready at one time and some may become too old in the seed bed before they can be planted out, with the result that they may go to seed after they are planted. Sow the seed in drills about 8in. apart and 1in. deep. Leave every seventh drill unsown and the patch will be in beds of six rows each, with a 16in. footpath between each bed. This leaves room to get amongst the plants to hoe and weed them. Make a wooden drill that marks out six or more drills at one time. Raking the bed lightly just when the first plants break through the ground saves a lot of weeding afterwards and does not hurt the crop. If the plants are at all backward water them with rather strong liquid fowl manure or sulphate of ammonia. When they are nearly the thickness of a penholder they are fit for planting out. In drawing them from the seed beds shake the soil from the roots and put them in straight bundles. They can then be more quickly planted. If the plants are too long, cut the tops back with a sharp spade while the bundles are on the ground. Never cut the roots. It pays to manure the land well. Put a dressing of stable manure on in the autumn. Plough this in and leave it until planting time. Then put on 5cwts. of good bonedust per acre, and plough or dig the land deeply. I usually plough two furrows deep, *i.e.*, about 10in., but I have always had the best crops from dug land. Then put on another 5cwts. of bonedust per acre and harrow, if the land has been ploughed. Rake it fine and mark out in the same way as was done with the seed beds. No line is needed, as the first line of the drill is drawn along the last line made. Tread out every seventh mark, leaving the patch in beds of six rows each, 8in. apart, with a 16in. space between. Plant three rows of onions from each side of the bed, setting the plants about 4in. apart. A good planter will put in about 10,000 seedlings in eight hours. The plants should be straight in the rows, so that a wheel hoe can be worked close up to them. This is much easier and quicker than hand hoeing. It is important that growing onions should be kept free from weeds. In places where water is available using sprinklers is better than running the water on, as it can be more evenly distributed. If the onions receive a check in a dry spell they are liable to be attacked by thrip, which may reduce the crop very considerably. It is not necessary to break down the tops when the onions are nearly ripe. When the tops have fallen of their own accord the onions should be piled and placed in rows to dry. Cover them with the tops, weeds, or anything handy, or the hot sun may scorch them. In a few days the tops and roots should be cut off, and if early sorts, they should be bagged up ready for market. I have found it a good plan to put keeping onions into banana crates and stack them on the ground for a few days to dry them before taking them into the store. They may be stored 3ft. or 4ft. deep on a wooden floor, which should be at least 1ft. from the ground, on shelves in the storeroom, or left in the crates under a shed. They should not be left in bags. It is important to have them thoroughly dry when storing. This crop may be successfully grown on the same land for years, but I think it is better to alternate with some other crop. They can be grown on a variety of soils, but a deep, dark, sandy loam will yield good crops of good quality. They involve a good deal of work, but a crop should return from 10 to 20 tons per acre. I have taken 4cwts. to the rod from a small patch, which would work out at 32 tons per acre." The writer of the paper demonstrated the methods he adopted in planting. He advised manuring and preparing the land early, and watering where possible, to start the weeds: they were then easier to destroy. The seed bed should be left loose after sowing, in order that the plants could make their way through. The seed should be put in to a depth of 1in. Plants should be put in just sufficiently deep to make them stand upright. Frosts did not directly damage the plants, but might cause the soil to become hard around the roots. The tops of onions should not be cut, but allowed to die down.

STRAWBERRIES.—Members had tried replanting strawberries, but did not think it profitable. The bushes ran out much more quickly than those in virgin land, and a great deal of attention was necessary to keep down the weeds. The general practice was to plant them among the young trees of the orchard, where the continuous working was beneficial to the trees. With good attention, and replacing the few plants which failed each year, the strawberries might be grown until the size of the trees demanded the selection of a new site for the plot.

Longwood, September 13.

(Average annual rainfall, 37in. to 38in.)

PRESENT.—Messrs. W. H. Hughes, E. Colbey, E. J. Oinn J. Roebuck, A. F. Furniss, E. A. Glyde, J. Brown, W. Nicholls, and J. R. Coles (Hon. Sec.).

VINEGAR-MAKING.—In a short paper Mr. E. H. Glyde said he had secured best results by cutting up two and a half cases of apples and adding to this 1gall. of water. The process took about 12 months to complete. The addition of sugar gave the vinegar a good color. Thoroughly ripe, sweet apples were most suitable.

MacGillivray, September 16.

(Average annual rainfall, 19in. to 20in.)

PRESENT.—Messrs. R. Wheaton (chair), H. Ayris, J. Matthews, A. J. Nicholls, H. E. Petras, A. Stirling, jun., H. C. Williams (Hon. Sec.), and one visitor.

SANDY SOILS.—Mr. Petras read a paper as follows:—" There are in our district fairly large stretches of sandy country, which, with a little study and capital, can be brought into very profitable use. There are two distinct classes of sand—deep white, and shallow sand over rubble and clay. On the former the white mallee and narrowleaf predominate. In treating a piece of land of this kind I would select where the scrub is thickest, rolling it in the early summer, and have it all ready for burning by the end of January, the fire being put in the first good opportunity. Ploughing should be done directly after the burn to retain the ashes as much as possible; 3in. is deep enough for a first ploughing on well-burnt land. White sand will grow wheat, and this should be sown first. The next year oats should be sown, and the following year I would plough the land directly after harvest and sow rape, mustard, &c. The fourth year a crop of barley could be put in, and after this it could be left out to grass for a couple of years. Sandy land should be ploughed every third season. Generally at that time the scrub again makes its appearance, and if this is left alone it will soon choke out all grass. Care should be taken that each share is cutting properly. They should be kept well sharpened; when blunt they are too apt to leave strong rooted scrub uninjured. Where sand is shallow over clay wheat should not be sown first. It is better to make fodder paddocks of this particular class of land until the stumps are got rid of; the plough should be put in to reach the clay, and work the sand and clay together, after which the land will grow practically anything. Trenching is, in my opinion, better than lime. Guano super. is a good manure for sand, and I could never notice any difference between this and bone super. or bonedust." Members agreed with much of the paper. Burning late was favored by the Chairman, who left it until March. Shoots were then less trouble in the crop. Oats were considered the best for the first crop. Fallowing might be done the second year, followed by wheat, if anything from 9bush. upwards was likely to be reaped. Guano super. was apparently as good as bone super. for grain crops, particularly barley, and it was cheaper. Mixing nitrogenous manure, such as ammonia, with super. in the proportion of one to five had not shown to advantage. Top dressing during early spring would probably give better results than including it in the sowing manure. An opinion was given that potash would give better results than ammonia or soda with barley. Ammonia was cheaper per unit of nitrogen than soda.

Meadows, September 16.

(Average annual rainfall, 35·52in.)

Present.—Messrs. G. Ellis (chair), Rev. J. H. Williams, J. J. Morriss, H. Thorne, F. Nottage, T. Usher, J. Stone, S. Smith, T. B. Brooks, F. W. Vickery, E. Vickery, W. J. Stone, W. Phillips, H. A. Kleemann.

Leakages on the Farm.—A lengthy paper under this heading was contributed by Mr S. Smith. Failure, in a great many instances, he said, was due in a large measure to carelessness. It was much better to live in one's own cottage than to have a large house heavily mortgaged. Fences should be kept in repair, and feed conserved against dry seasons. Every advantage should be taken of decaying vegetable matter, by applying it to the soil to form humus. Old stumps and logs on grass lands should be fired, the ashes being of considerable manurial value to the soil. The provision of suitable protection for vehicles considerably lengthened their life. They should be washed with rain water, if it were procurable. White lead and mutton-fat applied to the mouldboards of the plough would prevent them rusting. Harness should be kept well oiled. Bran and pollard should be kept in zinc-lined cases; the bags being hung over a wire. An interesting discussion followed.

Meningie, September 13.

(Average annual rainfall, 18·87in.)

Present.—Messrs. W. M. Wright (chair), Scott, J. G. Hastings, J. R. Williams, H. A Martin, H. N. Mincham, W. H. Yates, sen. and jun., S. Yates, and L. D. Martin (Hon. Sec.).

Poultry.—A paper on this subject was read by Mr. H. N. Mincham, who had for a number of years kept Minorcas, Andalusians, Silver Wyandottes, Black Orpingtons, Brown Leghorns, and White Leghorns. The last named, he said, were the most profitable. The best laying strains only should be kept. He made a practice of cutting a few acres of wheat, barley, and oats, and building a stack in which the fowls could scratch. Large quantities of greenfeed should be given them at midday; lucerne was good, and the boxthorn hedge also provided excellent food in addition to shelter. Meat was not necessary if milk could be supplied. The morning feed should consist of bran and pollard mixed with hot milk, and wheat should be fed in the evening. Hatching should take place early in the season, and the pullets should not be forced. Chicks hatched in an incubator would be quite as strong as those brought out by a hen, if they were given proper care and attention. Male birds intended for breeding should not be allowed to run with the hens until they were 12 months of age. They should only be allowed with the hens during the breeding season. Hens for breeding should be carefully selected. Cleanliness was of the utmost importance. Fresh water should be supplied three times daily, and be kept in the shade. Houses should be whitewashed, and shell grit and charcoal supplied. It was advisable to have plenty of nests available. A number of breeds should not be kept. Generally, it paid better to kill a sick fowl than to endeavor to cure it.

Utilisation of Waste.—Mr. J. G. Hastings also read a paper, from which the following is taken:—"There is on every holding a considerable amount of waste material which, if allowed to accumulate, will cause an unsightly appearance, whereas with a little foresight and thought it can be utilised to great advantage. Perhaps to the large landholder the value of refuse may not always appeal. He deals in large quantities, but to the man who is living on a slender income the little things mean much. Ashes, for instance, contain a quantity of valuable plant food in the form of potash, and yet on many places hundreds of pounds of this useful manure is lost in the course of a year; this should be returning wealth to the owner in the form of fruit and vegetables. A large box or tin should be kept handy to receive ashes as they are removed from the house, and at regular intervals they could be run through a fine sieve and then either spread on the land and dug in or stowed away till required. The coals can be used again in the fire or in the blacksmith's forge. At the wood heap, a large quantity of chips accumulate, and in course of time are reduced to a rubbly or powdered condition. In this state they are useful as plant food as well as providing humus for the soil, and if put on in sufficient quantities

keep it loose and so allow the heat and air to penetrate. Clay land especially is greatly benefited by a liberal dressing of this material. All hedge chippings, flower prunings, and weeds should be dug under. When buried in this green state all their valuable properties are absorbed by the soil. Where a horse or cow is kept, the manure should be gathered up daily and either put into a large watertight receptacle or dug under as soon as possible. If left heaped up on the surface the ammonia and nitrogen are lost. The floor of the pigsty should be so constructed as to allow the water and manure to be led off by means of a drain which conveys it to a receiver let into the ground. By this means it can be cleaned daily with very little trouble."

Mount Barker, September 10.

(Average annual rainfall, 30·93in.)

PRESENT.—Messrs. H. N. Bell (chair), Bishop, Moore, Hughes, Daddow, Mappley, Liebelt, Liebing, Schmidke, Hollanby, Fidler, Thomas, Barker, Dr. Scott, and J. E. Smith (Hon. Sec.).

BACTERIA IN THE DAIRY.—The Hon. Secretary (Mr. J. E. Smith, B.Sc.) contributed a lengthy paper on this subject. He described the different types of bacteria, their power of movement, method of multiplication, &c., also mentioning the allied micro-organisms, yeasts, and ferments. Perfectly pure milk, he explained, would not sour; this was occasioned by the growth of bacteria, which caused the sugar to change to lactic acid. The souring of milk in cases had been attributed directly to the influence of thunderstorms, but it was explained that the same atmospheric conditions which brought about thunderstorms stimulated the growth of bacteria. If the milk were kept cool this trouble could be overcome. Continuing, the paper read—" The first question naturally arising is whether there are any bacteria in milk at the time it is secreted by the cow. There is not absolute agreement on this. If the udder of the cow is diseased, the milk may be contaminated, even when secreted. It has long been known that when a cow has tuberculosis in the udder, her milk is practically certain to contain tuberculosis bacilli. It is equally sure that inflamed udders infect the milk with bacteria. When the udder is the seat of the inflammation it commonly produces pus, and this naturally finds its way into the milk. With the pus there are practically sure to be bacteria that are associated with inflammatory troubles. These are usually chain-forming bacteria, hence the presence of large quantities of such bacteria, especially if accompanied by numerous pus cells, indicates a diseased condition of the udder. Such are found in animals having mammitis or mastitis. These bacteria, if in considerable numbers, are certainly detrimental to the health of the persons drinking the milk. The general opinion is, at least under ordinary conditions, that if the cow be in health and her udder not injured in any way, the milk she secretes is at the moment of secretion free from bacteria. Whatever may be the condition of the milk when secreted, it is never sterile at the time it leaves the udder where bacteria are known to be abundant. These probably come from without, entering the milk ducts from the teat, feeding perhaps on the remains of the milk that clings to the passages between the different milkings. How far into the ducts these bacteria extend is again a matter of difference of opinion. Some have held that they are in all the ducts in the glands; others insist that the inner ducts are germ free in normal cows. It is thus very difficult to draw sterile milk from the cow, in spite of the greatest care. By extreme precautions in special tests small quantities of sterile milk have been thus obtained; but these precautions are not practicable in ordinary milking, so the dairyman must recognise that he cannot by any means of milking obtain sterile milk.

Sources of Common Milk Bacteria.—It is quite certain that bacteria get into the milk ducts from the outside. Some have tried to show that they may come from the tissues of the cow, being passed through the gland when the milk is secreted. But while this may be true in case the cow is suffering from some bacterial disease, such as tuberculosis or inflammation in the udder, it is practically certain that this does not occur in normal animals. They are found in the largest numbers just within the teats, where they enter between the successive milkings, and, in lesser numbers, further within the gland. They are in just the position to be largely washed out of the ducts by the first streams of milk drawn. This milk, called the fore-milk, is quite certain to contain more bacteria than milk from the other portions of the milking. During the milking the bacteria may be so thoroughly washed out by the milk stream that the last milk may be quite sterile. Most of the bacteria in the ordinary milk come not from the udder, but from external sources. These sources are several, and may be considered in succession. *The Cow.*—One of the chief sources of bacteria is the cow herself. Her skin, even when kept in fairly good condition, is never very clean and will always hold more or less dirt and dust laden with bacteria. The cow in many poorly kept dairies is, as is well known, rarely, if ever, cleaned; her flanks, tail, and skin become covered with a coating of manure, until the amount of filth attached thus to the animal is surprisingly great. All of this filth is laden with bacteria in large numbers. It is impossible for the cow to move without more or less of it falling from her body, and during the whole process of the milking, by the movements of the flanks, the rubbing of the skin by the milker, and the switching of the tail, there is constantly being shed a shower of such particles from her body. The filth that thus finds its way into the milk-pail consists of almost every conceivable kind of material. Besides excrement there are grass, straws, insect wings, hairs, and almost every other kind of small particles. The nature of this dirt and its amount depend upon the condition of the cow. There will be less on cows during the pasturing season than during their life in the sheds in winter. It will vary much with different foods. Dry foods, like hay, appear to furnish more bacteria in the manure than moist food, and the milk subsequently receives them. It frequently happens that a certain food fed to the cows injuriously affects the keeping of the milk, because the bacteria, which the food furnishes, find their way into the milk from the filth on the cow; for example—the feeding of turnips. *The Air.*—Fresh air out of doors does not contain many bacteria, and if milking could take place in the open, free air this source of contamination could almost be excluded. In a close shed, however, conditions are very different. The motions of the cattle are dislodging bacteria from their skins, which float for some time in the air. Hay, dirt, cobwebs, and other dry dust-producing materials are allowed to accumulate. Dirty straw bedding is another source of air contamination. The general manner of feeding the animals is even a larger source of contamination. If dry hay, or other dry food, is thrown down in front of the cattle, a large amount of dust will arise and spread through the air of the shed. Such dust is crowded with bacteria, many of which are alive and ready to grow. The common practice of keeping the cattle in the same room where they are milked is thus very productive of a large source of air bacterial contamination. The number of bacteria coming thus from the air varies immensely with the conditions of the shed. It is largest during and immediately after the feeding, especially when cows are fed upon dry food. *Milk Vessels.*—Perhaps the most prolific source of milk contamination, so far as numbers are concerned, is found in the bacteria which remain alive in the milk utensils between one milking and the next. Bacteria are not usually killed by short drying. After each milking the pails and other utensils are commonly washed, sometimes, indeed, thoroughly washed with hot water and soap; but no such washing is sufficient to destroy the bacteria which may be in them. After any ordinary washing there will be left clinging to such utensils many bacteria which are ready to develop as soon as fresh milk is added to furnish them with proper food and proper conditions. Every different vessel or utensil with which the milk comes in contact, on its way from the cow to actual consumption, adds its quota of bacteria. *The Milker.*—Of late years it has become more evident that the bacteria from the milker or other persons in the dairy are among the most serious. This is not so much because of the number that may enter the milk from this source, but of their types. In ordinary dairies the milker rarely makes any special toilet before milking, and is liable to perform this task in old, soiled clothes, with no special attempt at cleaning his hands or face. The number of bacteria added to the milk from such a source is, probably, not great and does not add materially to the bacterial content. But in one respect these bacteria assume a more important significance. The bacteria which produce diseases in one animal do not necessary produce diseases in others. Those which produce diseases in cattle, with some exceptions (*i.e.*, tuberculosis), do not usually have the same effect on man. But it is evident that any disease germs that may be present in one man are just the kind that can develop in any other human being. Therefore, the bacteria contamination from human sources is more dangerous to other human beings than any infection from animals. For this reason the bacteria which enter the milk from the milker are liable to be much more dangerous than those which come from any other source.

Effect of Temperature on Numbers.—The number of bacteria in the milk at any subsequent period is more largely dependant upon the temperature and age than upon the contamination. Milk, when fresh from the dairy, even from the slovenly, fifthy dairy, will rarely contain more than half a million or so of bacteria per c.c., and usually a much smaller number. By the time the milk is one or two days old the numbers may amount to 50,000,000 to 100,000,000, or even more. Milk from an ordinary cleanly, carefully kept dairy may have no more than from 10,000 to 50,000 per c.c. at the outset. But this milk, also, in the course of one or two days may have numbers as high as 100,000,000. The number of bacteria present at any time is, therefore, more dependant upon the age of the milk and the method of keeping it, than on the original amount of contamination. Milk which originally contained large numbers of bacteria, if kept cold, will, in 24 hours, show a much lower bacteria count than milk which originally had small numbers, but kept under warmer conditions. This should always be considered in drawing any conclusion as to the number of bacteria in milk. A single illustration will suffice to show the effect of different temperatures upon the numbers of bacteria. A sample of milk was examined for bacteria when fresh and found to contain 6,525 per c.c. It was then divided into two lots, one preserved at 50° and the other at 70°. The fresh milk contained 6,525 bacteria per c.c., that 25 hours old at 50° 6,425 per c.c., and that 25 hours old at 70° 6,275,000 per c.c. Observations seem to show that they do not increase for the first few hours after the milk has been drawn—thus the dairyman has a sufficient time in which to bring the milk into condition for further preservation. The second stage follows with the rise of temperature—all species seem to increase and the numbers amount to 10-20million per c.c., then the lactic acid bacteria seem to gain the upper hand and develop to such an extent that the other kinds are completely replaced. The third stage occurs when the milk has soured and curdled—the acidity is too great, and the bacteria cannot thrive. We may recollect, then, that the lactic acid bacterium acts as a sort of preservative—its rapid development preventing the growth of other species.

Disease Germs in Milk.—There is a wide-spread feeling that the bacteria in milk are closely associated with the distribution of disease—so they may be to some extent, but the commonest bacteria are quite harmless. Buttermilk may contain 500,000,000 per c.c., and is perfectly wholesome. As for the others, four specific diseases, tuberculosis, typhoid fever, scarlet fever, diphtheria, and perhaps cholera may be distributed by milk. Of these tuberculosis comes from the cow, so that it follows that all animals suffering from this complaint should be shut off from the rest of the herd, and their milk destroyed. Pigs and calves, if fed with such milk, may develop tuberculosis. Typhoid fever comes from human beings, and may be passed on to another directly, or, if after recovery, his clothes are not thoroughly disinfected, they may carry the germs of the fever for months; he milks, and the germs may enter the milk pail, and so be passed on to the consumer. Or, owing to the careless handling of matters from the sick room, the germs may be on the hands, the cow is then milked, and the germs pass into the milk, and so to the individual. Discharges from typhoid fever patients may be thrown upon the ground, percolate through the soil with the drainage, or be washed into the water supply—and thence to the cow, and so to the human being. Diphtheria and scarlet fever germs and diarrhœa are spread in a similar manner.

Dairy Methods.—Milk is an ideal medium for bacterial growth. It is a food well supplied with water, and when drawn from the animal, is at a temperature best suited for the most rapid growth of nearly all types of bacteria. The contamination of milk is mostly external to the cow—and the vast majority of these bacteria can be controlled. Therefore we should see that (1) none but healthy cattle are milked; (2) the milk is protected from external contamination; (3) we produce conditions which, as far as possible, prevent the growth of these bacteria. The cow should be examined periodically, and if suffering from any udder disease or tuberculosis, should be separated from the herd and her milk destroyed. The cow shed should allow the freest possible circulation of air—better on rising ground with a good drainage away from any water supply. The cleanliness of the shed is a matter of very great importance. The manure should be removed frequently and taken as far as possible from the shed, and should not be heaped just outside. Dust, cobwebs, &c., are only traps for accumulating dirt, sources of bacteria, thus aiding in the contamination of milk. The bedding, if used, ought to be changed frequently; clean shavings are recommended for this purpose. The place should be whitewashed when required, and water for flushing out purposes used frequently. Milking clothes should be made of washable materials, and sterilized each day. The person of the milker must be kept scrupulously clean, and no one who comes in contact with, or is suffering from any contagious disease, ought to be allowed to approach the milk, cans, cows, or dairy. To milk in the open is an ideal way; if that is not practicable, let the shed be open to the sunlight as much as possible. Do not feed when milking, but afterwards. Cow food always contains bacteria—and of course is moved when the animal is feeding—hence the bacteria are scattered. If the cow is groomed, and dirt and manure moved from its flanks, the milk stands a much better chance of being pure. If long hairs are on the udder, shave them off. For perfect cleanliness, milk cans, &c., should be put in a steam chamber and kept under steam at a considerable pressure for about an hour. This is impossible on the farm, so the next best thing to do is to use boiling water, soap, and soda, dry thoroughly, and then expose the vessels to the sun. The separators require the most attention; then cloths used for any cleansing should be frequently boiled. In milking, the plan of rejecting the first jets of milk is advised, then any bacteria which may have been in the teat are ejected. The udder should not be brushed, but moistened with a damp (not wet) cloth, A covered pail is preferable to an open one, and this should contain some kind of strainer to catch the larger particles of dirt, and keep them from the milk; if cloths are used, they must be boiled daily. Where many cows are to be milked a milking machine can be profitably used, but a steam jet is necessary to ensure perfect cleanliness. If the cows are stripped dry at each milking, the tendency to the development of bacteria in the udder is prevented, and the next milk contains fewer bacteria. The milk should be aerated, and then cooled immediately, and kept cool; this may mean the use of ice, but cold milk keeps infinitely better than warm milk. The use of preservatives in milk is to be condemned absolutely, and I believe in South Australia their use is illegal. If milk is boiled, all the bacteria which fail to produce spores are destroyed; such milk will keep longer than unboiled milk, but the spores will reproduce, develop, and so cause its destruction. This boiled milk has some advantages—it will never distribute any diseases, nor cause diarrhœal trouble, but the "boiled" taste is not pleasant, and boiled milk is somewhat less digestible than raw milk. Many people "scald" their milk—that is equivalent to pasteurizing it—the process being to heat the milk to a temperature of 160° and keep it at that temperature for 10 minutes or so. All the ordinary disease germs are destroyed, as well as the lactic acid bacteria. Expert opinion seems to differ as to whether pasteurized milk is more easily digested than raw milk, but agreement seems to be reached on the point if the temperature has not risen above 140°. Simple sets of apparatus can be purchased for use in the home, in which milk of doubtful purity can be rendered safe to use.

Narrung, September 6.

(Average annual rainfall, 17in. to 18in.)

PRESENT.—Messrs. L. Thacker (chair), G. G. Hacket, L. Bolger, L. H. Mann, T. Barker, F. McNicol, C. H. Metcalf, G. Brodie, E. L. and G. R. Goode (Hon. Sec.).

BUTCHERING.—Mr. L. Bolger read a paper in which he described the method of killing, dressing, and cutting up a beast. It should be yarded at least 12 hours before killing, he said, and it was advisable to rope it, drawing it up to a post so that it could be pethed. When the animal was down, the head should be placed so that the blood would run away freely. After the throat was cut a piece of cane or wire should be worked backwards and forwards up the spinal cord, which would cause the blood to flow freely. It should then be placed on its back, and skinning should be commenced by first taking off the fore legs and then ripping the skin down from the throat to the tail. Then it should be taken from the hock to within 12in. of the tail, care being taken not to cut the hide. After the skin was taken well down both sides the tongue should be taken out, the windpipe released, and the brisket and the H-bone sawn through. After the caul fat was removed the carcass should be raised about 4ft., and the skin removed from the tail and well down the back. The backbone should then be sawn down and the carcass allowed to hang all night. The following morning it should be quartered. The hide should be carefully salted all over and laid out flat.

Uraidla and Summertown, September 1.

(Average annual rainfal, 44·35in.)

PRESENT.—Messrs. H. F. Johnson (chair), E. Hart, E. Hawke, J. Rowe, G. Collett, Fleming, Kessell, Moulds, Cobbledick, Collins, and Prentice (Hon. Sec.).

PIG-BREEDING.—In a paper on this subject, Mr. E. Hart expressed the opinion that the cross between the Berkshire and Yorkshire or Tamworth was the pig best suited to this district. Sties should be built 18in. or 24in. above the ground, to allow of good drainage. The troughs should project from the side about 6in. The sow was capable of breeding at the age of 7 months, and the boar was fit for service at 12 months. However, it was advisable to delay farrowing until the sow had reached an age of 15 months, and the boar should be kept from continued service until 18 months old. Two good litters per annum were sufficient. Gestation lasted for about four months. Old sows were more constant and careful mothers than young. After farrowing, the sow should be fed on warm meal for the first few days. Cocky chaff or short straw should constitute the bedding. The young pigs should be castrated when five weeks old; at six weeks they should be weaned. Regular feeding was essential. Mr. J. Rowe thought pig-breeding in connection with gardening a profitable undertaking. Surplus vegetables made good feed.

STRAWBERRY-GROWING.—Members thought it inadvisable to replant strawberries on land previously under this crop, with the exception of Melbas, not being irrigated.

SOUTH-EAST DISTRICT.

Frances, August 26.

(Average annual rainfall, 20·74in.)

Present.—Messrs. J. McGillivary (chair), G. Holmes, L. McInnes, A. J. Baldock, F. Cooper, T. J. O'Brien, W. Tompkins, W. Jarred, V. Redman, B. F. Feineler (Hon. Sec.), and one visitor.

Seed Wheat.—The Chairman strongly advocated thoroughly cleaning wheat intended for seeding purposes. He described a grading machine, manufactured locally, which was very effective, and could be made at a cost of about 30s.

Cockatoos and Grubs.—Members reported considerable trouble with cockatoos pulling up and eating seed that was just shooting. The use of strychnine, poisoned wheat, or poisoned flour mixed to a paste with wheat and strychnine rolled into it, and sweetened with sugar, was recommended. Some members advocated shooting. A greyish striped, brown to dark-green coloured grub was causing much trouble in the wheat fields. It spent the day under the clods and fed on the wheat plants at night. Rolling was the best means of destroying the pest, and deep furrows ploughed round the paddocks prevented its ingress.

Glencoe, August 11.

(Average annual rainfall, 33·84in.)

Present.—Messrs. A. Dow (chair), J. Dow, H. A. Cameron, G. E. Copping, J. and W. Holloway, J. T. Halliday, F. A. Telfer, and G. F. Ferguson (Hon. Sec.).

Potatoes.—In a paper on the growing of potatoes, Mr. F. A. Telfer said it was essential to have land intended for this crop free of weeds. It was a good idea to skim the land before commencing planting. Only good seed, well looked after, should be planted. A change of seed also was advisable. For early planting Pinkeyes could be put in 24in. apart, with 30in. between the rows. Redskins, 30in. apart and 30in. between the rows, could then be planted; Snowflakes following. The seed should be cut at least every other year. The land should be ploughed to a depth of 5½in. or 6in., the dib being used for planting. Each night the ground should be harrowed to cover the seed in case of frost. It was a good plan to loosen up the soil with a disc cultivator just before the plants showed above ground; this could be followed by harrowing, which would destroy the weeds. Moulding should be done in damp weather, if possible. The Chairman thought skim ploughing early in spring a good idea, but had sometimes found that the potatoes grew just as well if planted under a dry sod. Mr. H. A. Cameron concurred. Last year, very late, he planted some poor seed in dry and hard ground. Opportune rains fell, however, and the result was some of the finest potatoes he had ever grown. Eel worms were likely to be troublesome in tubers planted in land that lay stiff and open. The Hon. Secretary reported that last year he scarified eight rows of potatoes immediately they were up, and left eight rows adjoining for a month. The crop from the former was 13 bags, and from the latter nine bags. Mr. J. T. Halliday had secured best results from grass land during the past two years. Shallow planting seemed best.

Naracoorte, August 9.

(Average annual rainfall, 22·60in.)

Present.—Messrs. L. Wright (chair), A. J. Johnson, W. E. Rogers, A. Pallant, R. A. Jenkins, W. Loller, C. Bray, A. Langeludecke, jun., W. H. Smith, A. Caldwell, J. B. Nolan, and S. H. Shinckel (Hon. Sec.).

Homestead Meeting.—The meeting was held at the homestead of Mr. S. H. Shinckel, and considerable interest was taken in the work being done on the holding. Last year Mr. Shinckel had put in 30 acres with wheat and oats, and drilled in chou moellier seed at the same time. The land was turned up very deep with a disc plough and sown dry with ¾lb. of chou moellier per acre early in May. In June the whole was reharrowed. From this 30 acres he had cut 16½ acres for hay, stripped seven acres for wheat, and six and a half acres of oats were reaped, which yielded 43bush. per acre. Altogether 23 acres were cut with the binder, the other seven acres being dealt with by the stripper. The oats cut for hay yielded about 2¼ tons to the acre, and the wheat for hay about a ton to the acre. The balance in wheat, which was stripped, yielded 18bush. per acre. In the first week in February he put 230 Merino sheep in the stubble and kept them for nine days. The chou moellier yielded a large quantity of feed. On April 22nd he put 150 sheep in the paddock and kept them there for 15 days. For 21 days from May 6th he had 50 sheep in the paddock. The average total of sheep grazed for the four months was 45, or one and a half sheep per acre. He was of the opinion that this fodder did better on soil with a limestone bottom.

Naracoorte, September 20.

(Average annual rainfall, 22·60in.)

Present.—Messrs. W. Loller (chair), W. E. Rogers, R. A. Jenkins, A. Pallant, A. Langeludecke, A. J. Johnson, F. H. Holmes, A. Caldwell, S. H. Schinckel, C. Bray, J. M. Wray, B. O. Henig, and W. H. Smith (Hon. Sec.).

Compulsory Dipping of Sheep.—The suggestion that sheep-dipping should be made compulsory, on which subject the Branch had written a number of Branches south of Adelaide, had been considered by these, with the result that Morphett Vale, Meningie, Tintinara, Longwood, Mount Gambier, Strathalbyn, Monarto South, and Hartley Branches favored the proposal, whilst Kanmantoo Branch opposed it.

Penola, September 29.

(Average annual rainfall, 26·78in.)

Present.—Messrs. H. Richardson (chair), W. Miller, J. T. Williams, J. Warner, A. E. Lampe, J. Alexander, A. H. Strong, L. Peake, and one visitor.

Spring or Autumn Lambs.—Mr. J. T. Williams read the following paper:—"The greater part of the lower South-East is so wet in winter than in many seasons, if the lambs are dropped in the autumn they become very poddy, and are subject to both lung and intestinal worms. They barely exist during the cold, wet months of July and August; in fact, a goodly percentage of them die off, the result being that at shearing time, although marking may have shown 80 per cent., there are then only 70 per cent. to face the shears; and a lamb stunted in the first few months of his life never makes as good a sheep as one that receives no check from the day of its birth. In this wet country the spring lambing has many advantages. More ewes can be carried through the winter months, and not being dragged down by the lambs they come into the spring in good condition, and will give a better return per head of wool. Further, there will not be so much tender wool in the clip from them as from ewes that have lost their lambs during the hardships of winter. At this period of the year the lambs drop right into the sunshine and coming grass. In consequence they get no check. During my term of management on Yallum Estate I have had one part of the flock each year timed to lamb in the spring, and on every occasion they have proved a better crop than those dropped in the autumn. They have been dropped in the latter part of August and September and shorn at the end of November, when they cut from 1lb. to 1¼lbs. of wool (which pays for the shearing). The wool is the only point of loss against the autumn lamb, which returns 3lbs. to 3½lbs., according to the season. Each year I have practically weaned the total number marked, and they do not appear to be nearly so subject to parasites as the autumn lamb, show more growth, and as hoggets they cut more wool. Thus, from my experience in the wet country I would advise the lambing to take place in the spring. But in rich high country the early lamb is undoubtedly the best, because the rich country dries off early in the summer, and leaves no succulent feed to keep a late lamb going during that season of the year, as in the lower country; and the aim of the producer on the rich land is a 'fat lamb,' which can be got off in time: afterwards to fatten the ewes on the spring grass. Whichever lamb one may favor or produce the great factor towards success is to feed them well, as the old saying still stands good, 'Half the breeding goes down the throat.' Do not have two lambs looking for one blade of grass, have grass before the lambs, whether autumn or spring."

Tatiara, August 30.

(Average annual rainfall, 19in.)

Present.—Messrs. M. Sullivan (chair), A. Fisher, A. Wilson, C. Sloude, Miles, Webb Marshall, Harvey, Stanton, Bond, Low, Truman.

Dry Farming.—Mr. Fisher read a paper under this heading, in which the need for systematic fallowing was strongly urged. The results of various experiments in different parts of the world were quoted. Members generally agreed that it was advisable to work fallow well, and recommended harrowing growing crops when they had reached a height of about 8in.

Tintinarra, September 6.

(Average annual rainfall, 18·78in.)

Present.—Messrs. J. Donaldson (chair), C. M. Ives, E. B. Northcott, J. Helling, C. P. Hodge, Taylor, Henderson, Taylor, Kneale, D. T. Kennedy, Kneale, Stead (two), Bell (three), M. F. Hodge (Hon. Sec.), and three visitors.

Farm Gardens.—In a paper on this subject, Mr. J. Donaldson said that, other things being equal, he would choose a site surrounding the homestead for a farm garden. This should be fenced with posts 12ft. apart, 4ft. 9in. out of the ground and 4ft. wire netting buried 3in., two barbed wires being placed above this. One acre enclosed in this way should provide sufficient flowers, fruit, and vegetables for a large household. Carrots, parsnips, trombones, marrows, potatoes, onions, &c., could be grown in addition to a dozen or two of fruit trees and vines. The fruit trees should be planted 18ft. apart and should be well pruned. Vines should be trellised, as there was then less danger of injury from frosts. An abundance of stable manure should be applied to the soil, and care should be taken to plant vegetable seeds at the proper time.

Wirrega, September 3.

(Average annual rainfall, 19in. to 20in.)

Present.—Messrs. H. Exton (chair), F. Meier, W. Fairweather, P. Prime, H. Laurenti, J. Bice, F. Knowling, R. Williams, F. and L. Densley, J. Green, H. Rogers, L. Pitman, L. Cook (Hon. Sec.), and four visitors.

Poultry on the Farm.—Mr. H. Densley read a paper, in which he recommended the White Leghorns for egg production and White Wyandottes as table poultry. Such breeds as White Wyandottes, Black Orpingtons, Plymouth Rocks, &c., were good for the dual purpose. Inbreeding was disastrous to the laying qualities and health of the birds. A rooster of a fresh strain should be mated with four to six of the best hens each year. Galvanized iron houses were best: brush and bags harbored vermin. Fowls given the run of the stables would lay better and require less feed than those closely confined. Breeding should be commenced about the end of August. Chicks hatched in March or April were usually of a good size by Christmas. Pure bred birds were best. The general opinion of members was that a change of blood in the stock was necessary only once in three years. Each male bird should have between 12 and 20 hens.

Shipping Frozen Carcasses.

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T. PASCOE,

MINISTER OF AGRICULTURE.

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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

New South Wales Wheat Crop.

It is estimated that this season's wheat yield in New South Wales will be the largest in the history of the State. Last year's crop was a record, 32,475,13bush. having been produced, an average of 14·6bush. per acre. It is not anticipated that the average per acre will be as high this year, but that the increased area under crop will give a higher total yield, which some authorities estimate at 36,000,000bush.

Queensland Wheat Crop.

The Acting Government Statistician has prepared an estimate of the wheat crop for Queensland for 1913, which shows 170,006 acres sown, of which 132,348 is estimated to yield 2,053,783bush. and 17,872 acres to yield 17,037 tons of hay and 19,789 acres cut for greenfeed. The yield last year was 1,973,605bush. of grain from 124,963 acres.

Price of Wheat in England, 1912-13.

The price of home-grown wheat in England during the cereal year 1912-13 averaged 32s. per quarter, a fall in price of 2s. 10d. per quarter compared with 1911-12. On the other hand the average price of imported wheat increased from 35s. 11d. per quarter in 1911-12 to 36s. 2d. in 1912-13. The average declared value of imported wheat in previous years was 33s. 10d. in 1910-11, 37s. 5d. in 1909-10, and 39s. 1d. in 1908-9.

Wheat Production.

In the September number of the *Bulletin of Agricultural Statistics*, issued by the International Institute of Agriculture, the wheat production of France, Hungary, and Roumania is estimated respectively at 87,833,000 quintals, 45,361,519 quintals, and 24,000,000 quintals, or 96·8 per cent., 90·3 per cent., and 98·6 per cent. respectively of the 1912 production. For the total of the following countries, Prussia, Belgium, Bulgaria, Denmark, Spain, France

England and Wales, Hungary, Italy, Luxemburg, Roumania, Russia in Europe (63 governments), Switzerland, Canada, United States, India, Japan, Russia in Asia (10 governments), Algeria (excluding the department of Algiers), and Tunis, the production of this year is estimated at 906,328,681 quintals, or 104·1 per cent. of the production of 1912 (which was 871,044,979 quintals).

Treating Young Pigs.

For three or four weeks after the pigs are weaned, at seven or eight weeks old, skim milk is fed with solid food mixed with it at the rate of about 12lbs. to 15lbs. of milk to 1lb. of grain. This mixture fed sweet and warm provides a moderate change from the sows' milk, and, being palatable, nourishing, and easily digested, produces thrift and highly profitable gains. As judgment dictates, the grain portion of the ration should be increased until the pigs are about three months old and thriving well, when a cheaper ration, such as pasture or green fodder in summer and roots in winter, may be gradually substituted for a part of the milk and the grain. Many of the most successful hog-raisers feed their young pigs very largely on skim milk, adding to it a small proportion of shorts or finely ground oats or barley, with the coarse hulls removed. On many hog-raising farms pigs from 10 to 12 weeks old are turned on clover or grass, when they receive little more than skim milk in addition to what they graze and gather while rooting up the sod. Pigs reared in this way not only put on weight rapidly and cheaply, but they lay the foundation for continuous profitable feeding, and whether for breeding purposes or the bacon market they fulfil the requirements exactly. They develop strong frames and lengthy, muscular bodies, providing an excellent medium for converting a large amount of cheap material that in many cases would be wasted into a highly valuable product.—*Agricultural Gazette.*

Foul Drinking Places.

Drinking from foul ponds and muddy drinking-places can inflict direct harm, because in that way many injurious organisms are introduced, not only into sheep, but into all kinds of animals. In these days, says the *Agricultural Gazette*, it is known that the harm done by worms is much greater than was supposed not many years ago, and there is a general desire to keep them in check by frequent drenching. Still, prevention is always better than cure, and when the foul water is proved to be a danger, care of drinking-places should be more rigorously observed. There is the special reason for prevention in the fact that several of the most injurious verminous attacks have not been found to be curable.

What Have You Learned?

"Experience instructs fools" is the translation of a Latin proverb with which one of the contributors to the topic this week begins his essay. It is generally conceded that where a man can profit by his experience he is in a rather sane state of mind and is getting along very well. In fact if we look around us the fact that comes home most forcibly is the tremendous numbers who pay no attention to the knocks of hard experience. but merely stand up to take another blow in the same place. What have you learned from past experience in farm management? The many who took an interest in the topic this week were unanimous upon one point, that thorough cultivation pays even to the sacrifice of a number of acres. The majority found they got larger crops from manured land. These are to all purposes established facts, yet how many farmers are ready to take every chance on poor cultivation in order to get in a larger acreage. For some years we have not had a season that brought home the truths of "thorough cultivation for sure crops" as we have had this year. Poorly cultivated and weedy land can be picked out anywhere this year; the past two seasons have to a large measure covered up inferior farm work, but this year it is bare.—*Farmers' Advocate.*

Chickens and Electricity.

Electricity has made rapid strides, but perhaps the most extraordinary development is in regard to poultry rearing. Eggs hatched in incubators sometimes yield a percentage of weak chicks, so that many young ones die during the first few days. If, however, electric currents are applied to the chicks, these have such a stimulating effect that they not only preserve the life of weakly chicks, but enable them to gain weight on their normal amount of food, becoming in about two months as heavy as chicks grown for three months in the ordinary way. It is estimated, says the *Poultry Keepers' Journal*, that a farmer could, by the application of electricity to his poultry farm, produce nearly 50 per cent. more chickens per annum at a cost which works out very much lower than the cost of producing the electrification. Indeed, the possibilities of electricity as applied to agriculture and farming are almost endless, and agricultural experts are watching with the keenest interest many experiments which are at present being made throughout the country on these lines.

Lucerne Soil.

Doubt as to whether a particular soil is suitable to lucerne deters many farmers from sowing this valuable crop. A circular issued by the University of California, says the *Agricultural Gazette*, gives some information upon this point. Lucerne, it is stated, is a deep-feeding plant, sending its tap-root far down into the soil for nutriment, and a deep, well-drained, moderately heavy loam, with no hard pan between the surface soil and the water-bearing stratum, is to be preferred. The best lucerne fields in California are on such soils. But short of the maximum of advantages the crop flourishes satisfactorily in many cases on light sandy soils and heavy clays. Soils containing water close to the surface are to be avoided, as in these the tap-root is likely to decay; therefore good natural or artificial drainage is essential to success with this crop. It is simply stated that most of the Californian soils are well supplied with the mineral plant food necessary for success with the crops, but that in many there is a deficiency of humus. It is suggested that to supply organic matter a winter green crop may be grown and ploughed in early in the spring before the lucerne is sown. This would be only a makeshift for a good dressing of farmyard manure, applied some time before the lucerne needs to be sown, in order that the ploughing may be done in time to allow of the land being brought into good condition by frost. In preparing the land the hard pan caused by repeated ploughings should be broken. That is to say, the land should be subsoiled. The circular recommends drilling lucerne seed on naked land, strongly condemning the plan, often adopted, of sowing it in a corn crop. The seedbed should be firm.

Balanced v. Unbalanced Rations for Dairy Cows.

With a view to demonstrate the loss which may be sustained by dairymen who supply their cows with unbalanced rations, the Department of Dairy Husbandry, University of Illinois, carried out the following experiment:—Two lots of nine cows producing practically equal quantities of milk and butterfat were treated for 131 days in every way alike, except in the rations fed. The treatment for several months previous to the commencement of the experiment period had been the same for all the cows. The rations supplied were as follows:—

	Lot 1.		Lot. 2.
Maize silage	30lbs.	..	30lbs.
Clover hay	8lbs.	..	5lbs.
Gluten feed	4⅔lbs.	..	3lbs.
Ground maize	3⅓lbs.	..	8lbs.

The ration fed to lot 1 was a well-balanced one for cows giving 40lbs. of milk daily, and had a nutritive ratio of 1 : 6; while that fed to lot 2 was deficient in protein, and had a nutritive ratio of 1 : 11. The following conclusions were reached:—The quality of the ration affects the physical condition of the animal, and the physical condition vitally affects consumption and production. The cows on the unbalanced ration lost greatly in flesh during the test, and their subsequent production was reduced. Lot 1, which received the balanced ration, produced approximately one-third more than lot 2 receiving the unbalanced ration. Thirteen cows on a ration with a nutritive ratio of 1 : 6 produced as much as 18 cows on a ration with a nutritive ratio of 1 : 11. Because of the lack of protein in the ration fed to lot 2 the other nutrients were not used to the best advantage. This shows in a striking manner that an excess of carbohydrates cannot be made to take the place of a deficiency of protein.—*University of Illinois Agricultural Experimental Station Bulletin* 159.

Imports of Grain into United Kingdom.

The imports of wheat into the United Kingdom during the cereal year September 1st, 1912, to August 31st, 1913, amounted to 26,500,565 quarters (of 480lbs.), these being greater by 2,391,000 quarters than the imports of 1911-12, and by 2,984,000 quarters than the imports of 1910-11. Including the produce of the home wheat crop of 1912 (says *The Journal of the Board of Agriculture*), and converting the imported flour into an equivalent quantity of wheat, the total quantity of wheat available for consumption in the United Kingdom was 37,324,750 quarters, compared with 35,472,600 quarters in 1911-12, and 33,854,000 quarters in 1910-11. In these amounts seed is included, but not stocks carried over.

Tuberculin Unions.

An example of what can be done is afforded by the tuberculin societies which have been formed in various parts of Denmark. The Tuberculin Union of Remkold will serve as an illustration (says the *Journal of the Board of Agriculture*). It was founded by Mr. N. O. Neilsen, veterinary surgeon, in 1905. Its rules are briefly as follows :—1. To become eligible for membership the farmer must have had his cattle inoculated with tuberculin. 2. He must divide his stock into two herds—one reacting, the other non-reacting. 3. He must keep the herds in distinct cowsheds, and provide them with separate pasturage and attendants. If possible, they should be isolated on different farms. 4. He must thoroughly disinfect the cowsheds, troughs, and all utensils used by the non-reacting herd. 5. He must have his healthy herd inoculated with tuberculin every six months. 6. He must remove the calves of the reacting herd and feed them either on milk from the non-reacting herd or on pasteurised milk. 7. He must not add any calves to the healthy herd except those which have given non-reacting symptoms to the tuberculin test made when the calves are some days old. 8. He must not add any cattle bought at a market to the healthy herd without previously submitting them to the tuberculin test. 9. He must sterilise the milk of the tuberculous cows before using it as food, either for man or beast. 10. He must immediately get rid of the reacting animals that show clinical symptoms of the malady. The union started with 29 members, and has now 155. Of the 155 herds of cattle 91 were healthy when their owners joined the union, while the remaining 64 were reacting. At present 135 of the herds are non-reacting, and only 20 reacting. The members have now 2,947 healthy cattle all told. Only two of the members have large herds of cattle—they have 800 and 300 head respectively. The other members have only 40 head or less; many of the members are small farmers possessing only three or four acres. Of the two large herds one is thoroughly healthy, while the one with 800 cows includes 80 reacting cattle.

Livestock Insurance in France.

The minimum premium which may be charged by the local livestock insurance societies in France is 1 per cent. of the value in the case of cattle; 1·6 per cent. in the case of horses, asses, and mules; and 2·5 per cent. in the case of brood mares: but in order to guard against the local societies charging premiums which are not sufficient to cover losses, societies having a deficit on their working are bound to raise the insurance premiums to an amount sufficient to cover a loss equal to that of the average of the three preceding years. The premium, however, must not exceed 2 per cent. of the value in the case of cattle; 3 per cent. in the case of horses, asses, and mules; and 3·5 per cent. in the case of brood mares. The three classes of animals must be kept quite distinct with regard to premiums and calculations of losses.

Families in Town and Country.

From the sixth volume of the Census of England and Wales, taken in 1911, it appears that the average number of persons per family has declined from 4·62 in 1911 to 4·51. This presumably means the number in a family resident in the house of the parents at the time of taking the census. The average is lowest in counties which are mainly agricultural, and highest in the mining districts, while that of large towns is between the two. This requires explanation, as it is surprising. It might have been supposed that the younger members of a country village family would stay in their homes longer than those of townsmen, whose work is more likely than work on the land to shift its location. But migration to towns and emigration take away many lads and young men, while country girls more generally go out to service than those of towns or the mining districts.

Zinc Salts in Soil.

Zinc salts, especially the nitrate, if present in the soil to an amount supplying less than 0·02 per cent. of zinc, have a stimulating effect; larger amounts were found to have a toxic effect. Zinc exercises only one-tenth the toxic or stimulating influence that lithium does. Lead, when present to the extent of 0·03 per cent., does not possess any toxic influence upon vegetation, and when this amount is given in the form of the nitrate a stimulating effect is observed. With regard to the influence of *lime and magnesia* on wheat, it is concluded that this plant may benefit from the addition of magnesia to a soil poor in that material, so long as the amount of magnesia does not exceed that of lime.—*Nature.*

Imports and Export of Fruits, Plants, Etc.

During the month of October, 1913, 17,236bush. of fresh fruits, 6,217 bags of potatoes, 226 bags of onions, 164pkgs. of swedes, and 56pkgs. of plants, seeds, and bulbs, &c., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910; of these, 3pkgs. of plants, seeds, and bulbs were rejected, and 198bush. of Queensland bananas were destroyed, being over-ripe. Under the Federal Commerce Act, 1,200 cases of fresh fruits, 238pkgs. of honey, 1,130pkgs. of dried fruit, 39pkgs. of preserved fruit, and 6pkgs. of jam were exported to oversea markets during the same period. These were distributed as follows:—For London, 225pkgs. of honey, 401pkgs. of dried fruit, 1pkg. preserved fruit, 2pkgs. of jam, and 5 cases of oranges; for Canada, 585pkgs. of dried fruit; for Germany, 9pkgs. of honey; for South Africa, 128pkgs. of dried fruit, 7pkgs. of preserved fruit, 4 cases of jam, and 3pkgs. of honey; for India and the East, 31pkgs. of preserved fruit, 6pkgs. of dried fruit, and 1pkg. of honey; for New Zealand, 832 cases of oranges, 363 cases of lemons, and 10pkgs. of dried fruit. Under the Federal Quarantine Act, 874pkgs. of plants, bulbs, seeds, nuts, &c., were examined and admitted from overesa markets.

Camel Team, Oodnadatta.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

Stock Inquiries.

(Replies supplied by Mr. F. E. Place, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

"G. DeC.," Dingabledinga, asks about the common round worm of the horse (*Ascaris megalocephala*).

Reply—These worms lie in the lumen of the small intestines, and a good way of getting rid of them is to prepare the horse with bran mashes for 48 hours and then administer a five or six dram aloes ball. The worms will come away when the purge acts. Afterwards give daily in the food sulphate of iron 1dr., sulphur 1dr., saltpetere 1dr., salt 1dr.

"G. F. B.," Kingscote, K.I., asks if the contents of a bottle labelled "Fowler's Solution, Poison," are intended as a worm medicine for horses as recommended.

Reply—Yes. Fowler's solution is a liquid which contains four grains of arsenic to the fluid ounce, two tablespoonfuls. This is the maximum safe dose for a horse, and the solution is a very convenient way to administer it accurately by putting the two tablespoonfuls on bran or chaff. It should be given once daily for a fortnight, left off for a fortnight, and repeated for another fortnight. Other inquirers will oblige by noting this reply.

"O. W. D.," Lameroo, has a foal three weeks old which, after a little trouble at birth, swelled in one knee and later in the other side hock.

Reply—The description is of a case of joint evil, which is an accompaniment of navel ill, although that organ is not mentioned in this case. Germs are absorbed during life in the womb, and abscesses result, not only in the joints but in organs such as the liver. Unless the foal is valuable or a pet, destruction would probably be the most economic method of dealing with it. If, however, treatment is desired, it should receive daily 1oz. of 5 per cent.

sol. acetozone (Parke, Davis, & Co.). The abscesses should be opened and the pus cleaned out, then the cavity should be syringed daily with 20 per cent. sol. of the same drug, which is expensive, but about the only one which has a good effect.

" A. P. S.," Maitland, has a horse with canker of the foot of three years' standing, which he has treated with formalin. This has kept the trouble in check, but he wants to know prospects of a cure.

Reply—A cure is not likely. Your line of treatment has been good, and if you are not tired, it would be interesting to try the following :—Use your local application as before, occasionally applying a few drops of pure creosote. Give two tablespoonfuls of Fowler's solution of arsenic in the food once daily for a fortnight; stop 14 days, repeat 14 for a month or two, and note if any alteration occurs in the feet. Procure 2ft. of rubber cord as thick as a pencil and wind tightly round the pastern. At first the horse will not stand more than 10 minutes morning and evening, but the time can be gradually increased to two hours. This often is most successful.

" W. H. W.," Renmark, has a cow which has small pimples on the teats. These burst in a few days and discharge a thick fluid which dries up to a scab and leaves a scar when it falls off. The cow seems in good health and had nothing of the sort before ; she was yarded with another showing the same symptoms.

Reply—This is a very good description of cowpox. Treatment.—Dose with Epsom salts ¾lb., powdered ginger ½oz., in a quart of warm water. Wash the teats with soapsuds, and after rinsing apply daily some of this lotion :—Tincture rhus. tox, 20 drops ; glycerine, 1oz. The disease runs a regular course.

" T. B. B.," Clarendon, asks symptoms of Cape tulip poisoning n a dairy cow.

Reply—Bloating, distress, diarrhœa, loss of consciousness. Treatment.—Stimulants (brandy), purgatives (Epsom salts or oil). A veterinary surgeon would be able to administer physostigmine and other remedies if called in time.

" M. A. N.," Wilkawatt, has a horse which had an eye injured by a piece of hair ; the eye has turned yellow, with matter under it. An ulcer has formed on the front of the eye (cornea), and most probably the horse will lose the sight.

Reply—Treatment :—Hang a cloth over the eye from the forehead-band and wet it three times a day with a little of this lotion—Tr. calendula, 1oz. ; methylated spirit, 1 pint ; water, 1 pint.

" W. L. McD.," Lameroo, has a horse with a tender swelling above the front fetlock. This has been in existence over four months. The swelling is very tender and the horse lame.

Reply—Apparently a strained synovial sheath of the extensor tendon, possibly injury to bone beneath. Treatment—Rest the horse let cold water trickle on to the place for an hour or two a day for a week or so; then, if tenderness has decreased rub in every day a little oleate of mercury, 5 per cent.

Whyte-Yarcowie Branch Agricultural Bureau reports a case of bloodworms in the purse of a colt, and seeks information.

Reply—(1) The appearance of these worms in the belly cavity is well known to the department, and is of frequent occurrence. (2) Local remedies will do no good. The worms must be attacked through the blood, with arsenic and quinine. The dose of arsenic for a yearling is a teaspoonful of Fowler's solution daily for a fortnight; of quinine 10 grains, or as much as will heap up on a sixpence. Both to be given in food. (3) The animal may be treated before the castration wound has healed or after. (4) The fact that it has had only well water emphasises the danger of having an accumulation of dung in the foal yard.

"E. P. Y.," Kercoonda, asks about a growth below a horse's hock, which has been removed once but recurs and bleeds when scratched; brown and hairless, about as big as a pigeon's egg.

Reply—Probably a neoplasm. Remove as before and sear well with red hot iron. If the growth appears to be reforming as the wound heals, make a thick paste with Cooper's dip and lard or vaseline, and apply with a stick once a week.

"G. R. H.," Murray Bridge, reports a case of sanding in a horse on dandelions, and asks for treatment.

Reply—Keep the animal off the dandelions, which nearly always sand a horse, and give a pint or two of new milk, with or without a pound of honey. Repeat if necessary in a week.

HORTICULTURE.

(Replies supplied by Mr. G. Quinn, Horticultural Expert.)

"W. R. C.," Berri, forwards specimens of a beetle said to be ringbarking branches of young apricot trees. He asks for identification.

Reply—The insect is a weevil beetle, belonging to the *Curculionidæ*, and known as *Polyphrades longipenius*. It is an indigenous insect, which has migrated from the eucalyptus to the apricots. If sufficiently numerous to warrant it, spray the trees with arsenate of lead, 1lb. in 10galls. to 20galls. water.

"F. H.,' Ramco, asks—"Would walnuts make a good breakwind; if so, how close should they be planted and the best variety to plant"?

Reply—Walnuts are not recommended as a wind break, as they themselves suffer much from the battering of hot winds, particularly in hot dry localities.

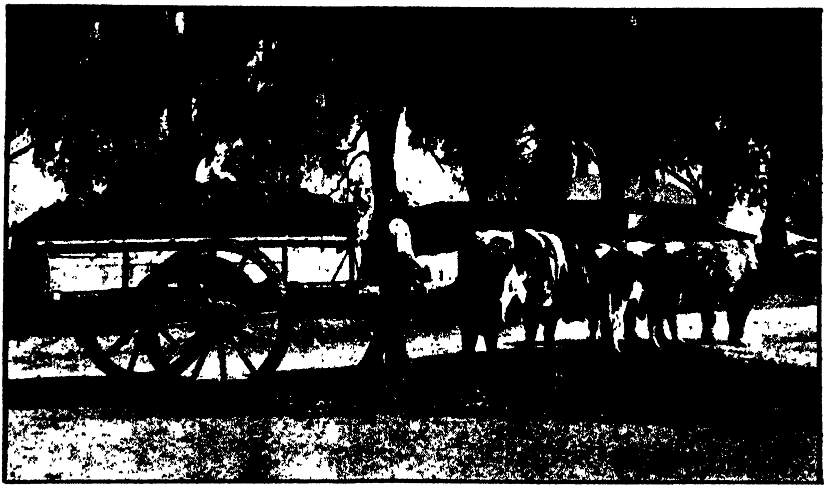
"B. J.," Wilmington, asks how to raise native or wild peach.

Reply—The native peach (*Santalum acuminatum*) is raised from the fresh stones or pits. They may be sown in pots or tins, and put out into the garden later without disturbing the roots. Most hard seeds of this character, however, germinate better if heated, say, by boiling water being poured over them, or better still, being buried an inch or two under the pulverised soil and kindling a fire over them.

"J. C.," Houghton, inquires as to method adopted in raising pears from seed, and what is the best commercial variety of passion fruit.

Reply—The seeds of most cultivated pears do not germinate well, hence those from coarse kinds such as Chaumontelle should be taken. The nurserymen import their pear seeds from France, where they are saved from certain suitable kinds. They should be sown in autumn in drills, in well tilled land, and covered about ½in. to ¾in. deep. The seedlings are very slow of growth and form merely a spur-like shoot the first year. *Passion Fruit.*—There is only one kind of passion fruit of commerce, that produced by *Passiflora edulis*. This may be grown from the seeds extracted from fruit imported from New South Wales by our fruit merchants. Sow the newly extracted seeds when freed of pulp in well-drained boxes in the finely prepared soil, covering them about ¾in. deep and pressing the soil firmly upon them. The spring time and early summer season is the best time for sowing.

* * *



Carting Grapes.

AGRICULTURAL EDUCATION.

A SPLENDID GIFT.

All those interested in the welfare of South Australia, and particularly in the advancement of agriculture in the State, will heartily appreciate the patriotism and munificence of Mr. Peter Waite in donating his residence, "Urrbrae," and grounds, for the purpose primarily of agricultural education. The announcement of the gift was made by the Premier (Hon. A. H. Peake, M.P.) in the House of Assembly, on Tuesday, October 14th.

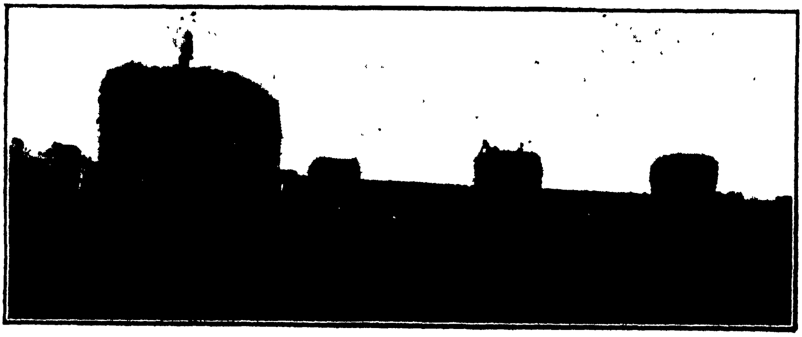
Mr. Peake said he desired to make a statement that would be of interest to the House and the public generally. One of their generous citizens (Mr. Peter Waite) had proposed to make a gift in the interests of agricultural education and of public recreation. (Applause.) The gift was in two parts—one to the Government and the other to the Adelaide University—but they could be regarded as one complete proposal. It was particularly gratifying to him, as it marked the consummation of one of the aims which the Government of 1909 had included in its programme, and also because it gave effect to one of the recommendations of the recent Education Commission. Prior to the publication of the Commission's report, and without a knowledge of its intentions, the Commissioner of Crown Lands was in communication with Mr. Peter Waite, who desired to make the gift in question for the best possible purpose; and, with the Commissioner, he visited the Agricultural High School at Ballarat, and was there confirmed in his desire to further agricultural education. The proposals were contained in a letter received from Mr. Peter Waite, dated October 3rd, in which the donor said he had offered Urrbrae house and 134 acres of land to the University, half of the land to be available for agricultural studies and the balance as a public park. He had also offered the Government 114 acres of land for an agricultural high school. The property was situated between Glen Osmond and Mitcham, and was within four miles of the G.P.O. He did not like to put a value on it, but it probably represented between £40,000 or £50,000. The land for the agricultural high school was ready for immediate occupation. The only condition attached to the gift was that the University and the estate should not be liable for succession duties when the property fell into its possession. The Premier then read the following correspondence, in which the gift and the conditions attached to it were outlined:—"Adelaide, October 3rd, 1913. Dear Mr. Peake—Following upon our conversation of August 30th last, I have now arranged to hand over to the University of Adelaide my Urrbrae house and grounds, embracing an area of 134 acres, half of the land to be available for the University for agricultural and kindred studies, and the balance as a public park under their control. I enclose copy of letter which I am to-day sending to the Chancellor of the University. I now formally offer to the Government of South Australia part section 250, hundred of Adelaide, containing 114 acres for the purposes of an agricultural high school. This land adjoins Urrbrae. In coming to the decision to make this offer I have been much influenced by the wonderful work our agriculturists and pastoralists have accomplished hitherto in face of the very heavy odds they have had to meet. With comparatively little scientific training they have placed our wheat, wool, and fruits in the highest estimation of the world; our sheep have been brought to such perfection that they are sought after, not only by all the sister States, but by South Africa; our agricultural machinery has been found good enough even for the Americans to copy; and our farming methods have been accepted by the other States as the most up-to-date and practical for Australian conditions. We have now reached a point when it behoves us to call science to our aid to a greater extent than hitherto has been done, otherwise we cannot hope to keep in the forefront. It seems to me that our manufactures must soon overtake the requirements of the Commonwealth, and that it is to the land we must look to occupy the coming generations. The only condition I wish to make in regard to the two gifts is that they are contingent only upon the Government undertaking that neither my estate nor the University shall be called upon to pay succession duties thereon. I would like to see the agricultural high school under the control of a board, which might be constituted as follows: Two representatives selected by the Government, and one each by the Royal Agricultural and Horticultural Society, the University, and Elder's Trustee and Executor Company, Limited. This wish, however, is not put forward as a condition of the gift. Further, I hope that some arrangement will be made for those boys who distinguish themselves at the agricultural school to be attracted to the higher work which will be done in the scientific schools of the University. The land for the agricultural high school is, as you know, ready and available for the commencement of operations at any time should my offer of it be accepted. Yours faithfully, PETER WAITE. The Honorable the Premier of S.A., Adelaide."

The following letter had been sent by Mr. Waite to the Chancellor of the University:—"Adelaide, October 3rd, 1913. The Right Honorable Sir Samuel Way, Bart., P.C., Chancellor of the University of Adelaide, Adelaide. Dear Sir Samuel—It appears to me that we are approaching a point in the history of the State and Commonwealth when our manufactures will more than keep pace with the local demand. Our population will, however, continue to increase, I hope, more and more quickly, and the natural outlet for the energies of our rising generation appears to me to be in producing wealth from the land. Our State has hitherto done notably in all branches of agriculture and the allied arts, and largely without scientific direction and education. In the future competition threatens to be so keen that we must equip our people in the best possible manner. In the belief that such sections of the University work as agriculture, botany, entomology, horticulture, and forestry can be better dealt with upon such a property as Urrbrae than at North Terrace, I now desire to offer as a gift to the University the Urrbrae estate of 134 acres, for the following purposes, viz. :—(1) The eastern portion, say 67 acres or thereabouts, with the buildings thereon, to be used for the purposes above outlined, interpreting them in their widest sense. (2) The remainder, say 67 acres or thereabouts, to be a public park under the control of the University ; but if it be thought advisable I would be quite willing that 10 acres or 15 acres, or such area as might be found necessary, should be used as a students' sports ground. When the University authorities have considered this matter I will be pleased to know their decision, and if my offer is accepted the title can be at once transferred to the University, subject to the life tenancy of my wife and myself and of the survivor of us. I am making it a condition with the Government that the University shall not be liable for any succession duty when the property falls into your possession. Yours faithfully, PETER WAITE."

OFFER ACCEPTED.

The Premier said the University Council immediately accepted the munificent offer, and viewed Mr. Peter Waite's action as highly patriotic. The Government regarded the offer to it as equally important. All the members of Mr. Waite's family were agreed in the proposals. (Applause.) Mr. Waite had done a great deal in developing the important pastoral interests in the interior. No name was better known than was his in that respect. (Applause.) It was gratifying to know that he was still interested in its further development. The fact that the University School and the Agricultural High School would be side by side should conduce to the success of both, as well as to economy in their working. The proposed Fullarton tramway terminus would extend to both properties, which were within four miles of the G.P.O. Members of that House would be able to appreciate the great value of the gift. The land altogether comprised close on 250 acres, and was in the County of Adelaide. In itself it was very valuable. Not only was there the land, but a mansion in addition. It was a joint gift to the State and the University. It would enable the Government to give effect to one of the recommendations of the Education Commission, which was that there should be an agricultural high school near to the city, so that boys in Adelaide who had no other chance of getting out into the country could go there and learn the elements of farming, and possibly a good deal more. Then they would be better fitted to go into the country and exercise their faculties in their own interests as well as those of the State. It would draw away boys whose outlook now was nothing but a city life. Mr. Waite was a gentleman who, by a life's work, had done a great deal, chiefly in association with the late Sir Thomas Elder and other gentlemen, whom they were all proud to remember, in developing the important pastoral interests of the interior, and who had rendered great service by giving of their wealth to benefit their fellow citizens. Mr. Waite's name would go down honorably associated with those gentlemen as one who had striven successfully to do good in the land of his adoption. (Applause.)

At a meeting of the Council of the University held on October 9th, it was resolved that the following letter expressing the Council's appreciation of his generosity should be forwarded to Mr. Waite:—"October 10th, 1913. Dear Sir—Your letter of the 3rd instant to the Chancellor, offering one-half of your Urrbrae estate to the University for promoting the study of agriculture and allied subjects, and the other half for the purposes of a public park under the control of the University, was laid before a special meeting of the Council on the 9th instant. The Council unanimously decided to accept your munificent offer, subject to the conditions set forth in your letter. They have no doubt that the object you have in view will be of immense value to the State of South Australia, and that Urrbrae is pre-eminently adapted for carrying out your plans. The prospect of founding a school of agriculture under auspices so fortunate and conditions so favorable is viewed with very great satisfaction by the Council. We are desired to convey to you the Council's most cordial thanks for your noble benefaction, and to assure you that your generosity will be gratefully remembered for all time by the public of South Australia, and in particular by the members of the University of Adelaide.—We are, dear sir, yours sincerely, S. J. WAY, Chancellor, WILLIAM BARLOW, Vice-Chancellor. Peter Waite, Esq., Urrbrae, Glen Osmond."



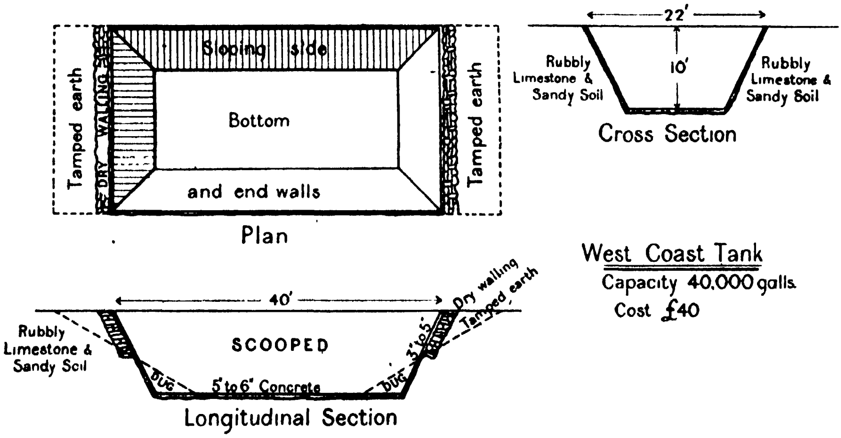
Haymaking.

CHEAPLY CONSTRUCTED TANKS.

In reply to inquiries for the details of construction of the cheaply constructed tanks referred to in his address to the Agricultural Bureau, the Government Geologist (Mr. L. Keith Ward, B.A., B.E.) has furnished the following diagrams and notes :—

CEMENT TANKS.

The tank illustrated on this page is typical of those constructed by farmers in the more sandy portions of Eyre's Peninsula to the east and north of Streaky Bay. In this district the problem of water conservation is a very difficult one, as the great majority of the wells sunk have been failures, while the porous nature of the soil precludes the use of unlined excavations for surface conservation.



Plan

Cross Section

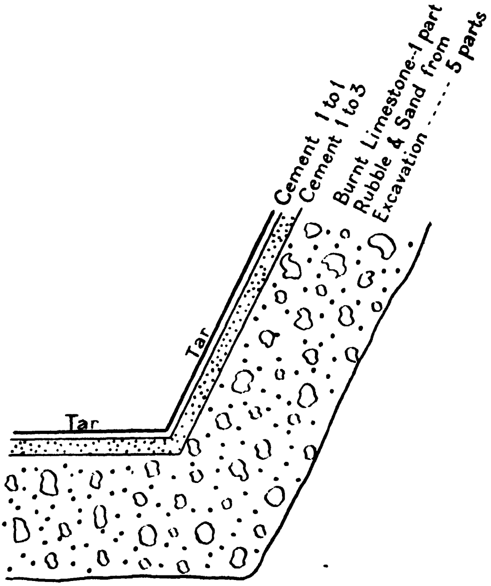
Longitudinal Section

West Coast Tank
Capacity 40,000 galls.
Cost £40

Generally speaking the excavations made show a sandy material, or sometimes a very soft sandstone and a limestone rubble lying beneath the surface soil and mixed with sandy material. A site for a tank is chosen, if possible, at the foot of a steep slope, often where a well-beaten road provides a good gathering ground and run for the water. In some cases the catchment is cleared of soil to the underlying limestone to provide a better run off.

The tank figured was excavated with a tank scoop and bullocks, but the toe of the sloping ends had to be dug by hand and the earth packed behind a dry stone wall of limestone. The sides and ends were sloped to permit of the concrete being laid in place with a shovel, and to do away with the necessity of using forms or moulds. The concrete was made of one part of locally burnt lime to five parts of sandy rubble got from the excavating of the tank. The walls vary in width from 3in to 5in., the bottom being slightly thicker. The concrete was faced with two coats of cement, one to three and one to one of sand respectively, and finally tarred. It was then roofed with brushwood and fenced to prevent stock from falling in.

The owner gave the cost as £40, and stated that two men could construct the tank in a month. Cement is used throughout, where the materials are not available for making lime, in proportions varying from one to seven to one to nine.



Detail Section

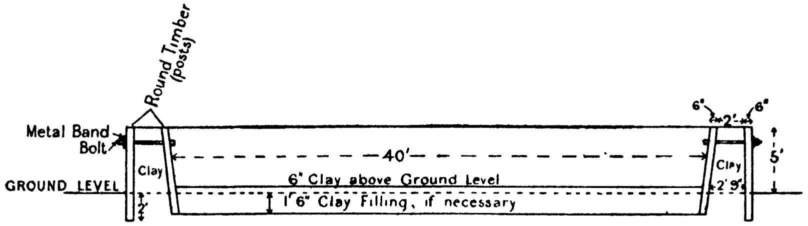
It should be clearly understood that this frail type of tank is only suitable for sandy ground, as the presence of any considerable proportion of clay will rack the masonry to pieces owing to the expansion and contraction of the clay with the changes of the weather. Subject to this limitation, the tank will be found to be efficient and to have the merits of simplicity and cheapness. For men of limited capital the construction of such tanks is wiser than the expenditure of an equivalent amount in well-sinking in districts where a wide spread distribution of useful underground water is known to be absent.

MUD TANKS.

The " mud tanks " which are used in the eastern and north-western parts of the State have been devised to take advantage of the local supplies of building materials in localities which are remotely situated, and where the cost of transport prohibits the purchase of metal tanks.

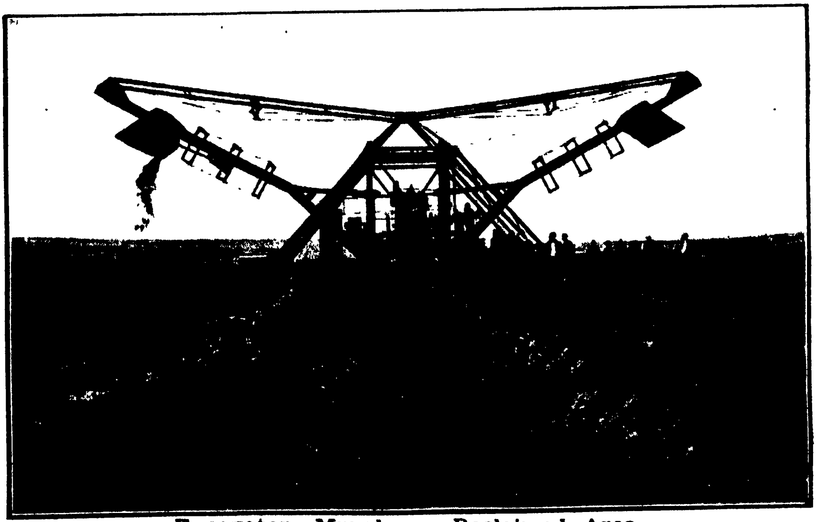
The only materials employed are round timber posts, clay, and an iron strap or band which encircles the tank like the hoop round a barrel, being fastened to the timber by long bolts. Angle iron is sometimes used for the band encircling the timber. The sectional diagram explains the construction of one of these tanks.

There are two circles of posts, those in the outer circle being vertical and sunk 2ft. into the ground, while the posts of the inner circle are slightly inclined and are not quite so deeply buried. The bottom is excavated, if necessary, to a depth of 18in. and the excavation is filled with clay. In any case a layer 6in. deep of clay is placed at the bottom of the tank. The space between the two rings of posts is filled with clay, which is rammed hard into position. Should this clay crack and open during periods of disuse it can very easily be moistened and rammed tight again when the tank is to be used once more.



Mud Tank. -Capacity, 35,000galls. ; cost, £40.

In many cases these tanks are surrounded on the outside with clay, which is heaped against the outer ring of posts and rammed down. In other cases the tanks are more deeply buried than the example shown in the diagram.



Excavator, Mypolonga Reclaimed Area.

AUSTRALASIAN FRUITGROWERS.

TENTH ANNUAL CONFERENCE.

The Tenth Annual Conference of the Australasian Fruitgrowers was opened by the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), in the Exhibition Building, on Wednesday, October 22nd, and was continued with intermissions, when various functions of a social nature were held, until the evening of Friday, October 25th. The President (Mr. E. Hannaford) presided, and the following delegates attended :—Vice-president, Mr. J. Tully (Victoria); Queensland—Messrs. H. J. Kipping and T. I. Reaney; Western Australia—Messrs. M. H. Jacoby and W. E. Dempster; New South Wales—Messrs. H. J. Rumsey, E. K. Wolstenholme, and W. E. West; Victoria—Messrs. A. F. Thiele and J. H. Lang; Tasmania—Dr. Benjafield and Messrs. L. M. Shoobridge and E. R. Shields; and South Australia—Messrs. G. R. Laffer, H. E. Pitt, and C. T. Fisher. The official visitors were—South Australia—Mr. G. Quinn (Horticultural Instructor); Western Australia—Mr. J. F. Moody (Fruit Industries Commissioner); Victoria—Professor D. McAlpine (Commonwealth Pathologist) and Mr. J. G. Turner (Chief Horticultural Officer); and Tasmania—Mr. J. Osborne (Fruit and Forestry Expert).

THE OPENING SPEECH.

The Minister, in the course of his opening speech, after welcoming the delegates, said—Those present have had the privilege of seeing some of the work we are doing on the River Murray to bring into profitable use, by means both of reclamation from the river and of irrigation, land that is eminently suited for closer settlement. The high land which it is proposed to work at Mypolonga, and which I believe is eminently suitable for the growth of citrus trees, stone fruits, and vines is typical of a vast area of land in this State adjoining the river, which only requires to be irrigated to produce in abundance. Given a market for the produce that could be raised on such land, I think that I am within the mark in saying that there is in this State over 100,000 acres of such land which can be made available to fruitgrowers.

AREA AND OUTPUT.

"I find on consulting the Commonwealth official statistics that the total area under orchards, vineyards, and market gardens exceeds 300,000 acres, and the total production from this area is valued at about £6,000,000.

Judging by the value given for the South Australian output I believe that this is a conservative estimate. I am given to understand the average annual labor bill for the orchard, vineyard, and market garden exceeds £10 per acre. This means that you represent industries which are spending over £3,000,000 annually in labor, in addition to the vast amount of indirect employment in the trades which cater to your requirements. The area under orchards is rapidly increasing, and so far as the suitableness of the land for either fruit production or vines is concerned the area under cultivation can be multiplied enormously. In our own State, within 50 miles of Adelaide, we have scores of thousands of acres of land eminently adapted for these purposes, and I believe the same applies to the other States, though not, perhaps, in close proximity to the capital. The chief problem of the future, therefore, is the disposal of our crops.

Local and Oversea Markets.

" It appears to me that our own local markets have not been developed to anything like their fullest extent. In a hot climate like this fruit should be an article of diet of everyday use on the tables of every class of the community —(hear, hear)—yet through inefficient means of distribution its cost during a large proportion of the year is such that it is a luxury for even the middle class of the population, while the poorer classes have to go without it altogether. Why this is so or what is the best means to overcome it is not for me to say, but I feel strongly that the whole of the present production of fruit is not in excess of what should be consumed in Australia. A great deal of attention is being given to the question of the oversea markets, and in their development the outlet for a large quantity of fruit is looked for. The extension of our oversea trade will depend, first, on opening up new markets for our fruit, and, second, on enlarging our present markets by reducing the cost at which we can place it on these markets. In this connection I am pleased to say that the feeling in favor of direct trade with the provinces of England is steadily growing. The General Manager of our Produce Depot and our Trade Commissioner in London have, from practical experience of marketing fruit and other produce in London, been strong advocates for direct shipments to the outports ; and I think the more the question is studied the stronger appear the arguments to get away from Covent Garden market. The opening of the Panama Canal, with the alteration in the American tariff, is expected in many quarters to lead to a development of the fruit export trade from Australia to that country, and I trust that these expectations will be realised, as, if we can get an entrance into the markets of such a wealthy community, it should add to the prosperity of Australia."

After referring to the operations of the Government Produce Depot, Mr. Pascoe proceeded :—" Dealing with the question of local markets, the figures concerning our imports and exports of fruit are of interest and suggest that our growers are not making as much of the local market as they might. I find that for 1912 Australasia shipped £656,000 worth of fruit and fruit products, and that the declared value plus duty of fruit and fruit products imported into the Commonwealth during the same period was £766,000, showing an excess of over £100,000 in favor of imports. It is true that two of the largest items are dates, valued at £66,000, and bananas, £174,000; but, with the cool storage facilities which now exist, it does appear a reflection on our enterprise that we should import £38,000 worth of apples, £33,000 of citrus fruits, and £135,000 worth of preserved fruits, jams, and jellies. I also note that last year the Commonwealth imports of almonds, with duty, amounted in value to over £30,000. This certainly is a crop which we ought to produce up to our requirements. There may be good reasons for such importations, but these figures should afford food for thought.

CO-OPERATION.

" I would commend to the notice of the delegates the figures showing the cost of the Doncaster Co-operative Fruit Store, which were furnished by Mr. Tully at the recent annual meeting of the Victorian Fruitgrowers' Association. Although head of the department which provides the only facilities of cool storage of fruit in Adelaide, I am a strong believer in the fruitgrowers taking this matter up for themselves. In Victoria I notice there has been, of late years, a decided improvement in this direction, but in our own State no action has yet been taken to establish cool stores in the fruit districts. Working on the lines indicated by Mr. Tully, there is no doubt the growers themselves could run a co-operative store much cheaper than any Government department or proprietary company could do. Much could be done in this and other directions by co-operation of growers, and I am pleased that the co-operative spirit appears to be making greater headway among the fruitgrowers than has been the case in former years." (Applause).

BUSINESS OF THE CONFERENCE.

Notes by G. QUINN, Horticultural Instructor.

The tenth annual conference, composed of delegates representing Fruitgrowers' Associations in all of the States of the Commonwealth, but not from New Zealand, met this year by rotation in South Australia. On Tuesday, October 21st, through the courtesy of the Minister of Agriculture and Irrigation, the visiting delegates were met at Murray Bridge by the executive of the South Australian Fruitgrowers' Association and several officers of the Department of Agriculture, including the Director of Irrigation. The Irrigation Department's fine launch *Alexandra* was placed at the service of the party, which consisted of about 40 fruitgrowers, who were conducted over the reclamation works now in progress at the swamps known as Mypolonga, Pompoota, and Wall, which in all comprise about 2,000 acres. The huge machines used in excavating channels and trenches, filling trucks, and mixing concrete excited great interest and raised the enterprise of the Americans for making and the South Australian department for using such machines higher in the estimation of the visitors. The party was conducted over the works by Mr. McIntosh, who lucidly explained the reclamation now in process of completion. Several hundreds of acres of the higher lands behind the Mypolonga swamp are being provided with main concreted channels, 70ft. and 120ft. respectively above the river, and this area will be cut into blocks for fruit-growing, which may be carried on in conjunction with working a certain area of reclaimed swamp land for fodder-raising as well as dry back country for running stock. Returning to Murray Bridge the delegates continued their journey to Adelaide by the evening train.

The sittings of the conference in Adelaide, presided over by the President for the year (Mr. Elliott Hannaford, of South Australia), were opened by the Minister of Agriculture (Hon. T. Pascoe), who, in a carefully-prepared speech of optimistic tone, welcomed the visitors to South Australia.

Preliminary business over, the conference immediately proceeded to demolish various suggestions made by the Federal Fruit Commission, more particularly in respect to its request that two members should be sent to Great Britain to inquire into the marketing of Australian fruits there. The perennial request to raise the duty on lemons and other fresh fruits from countries which are not prepared to give a *quid pro quo* to Australian fruits in their ports was turned down as an act tending to create retaliation most likely by the United States, in whose direction the attention of the Australasian fruitgrower is now being focussed very eagerly, more especially because of the opening the Panama Canal route offers to their produce being placed upon the densely-populated eastern coast of the United States of America.

An outing, *via* Teatree Gully and homeward through the prolific orchards of the Torrens Valley, combined with a social in the evening at a city café completed the first day's proceedings.

When the conference met on Thursday, October 23rd, the freetrade instincts which are natural to the primary producer again asserted themselves, and motions to ask the Federal Government to permit the introduction of bonedust—subject to certain precautions against anthrax coming with it—to abolish the duties on apple-wrapping paper and wire nails were carried with unanimity.

The report of the pomological committee, which met in Melbourne in April last, was presented by its chairman (Mr. L. M. Shoobridge) and elicited a certain amount of discussion. On the whole the work of that committee met with cordial support, and the members were asked to continue and meet again in Hobart next May, if possible. The work of the secretary, Mr. Pescott

(Principal of the School of Horticulture, at Burnley, Victoria), was praised, and the hope expressed that, owing to his peculiar fitness, he would be allowed to continue to act by the Minister of Agriculture of that State. The object of this committee is to secure uniformity of nomenclature for the same varieties of fruits when grown in different States. One delegate very seriously urged the committee to try as far as possible to restrict the lengthy character of some of the names, and the conference in sympathy therein resolved that whenever expedient one word should be made to suffice—truly a sign of the desire of the age to economise in time and energy, and get there in the quickest way, irrespective of the claims of priority of usage, euphony of sound, or depth of meaning expressed in the nomenclature of such of our choisest fruits which have come down to us as the gifts of past generations of gardeners of all nations.

The agenda contained a reference to that "hardy annual" a Federal Bureau of Agriculture. There was evidence that some of the fruitgrowers at any rate are beginning to believe that a properly constituted Federal Department, having for its main objects such scientific investigations as are now being performed in a scrappy manner by State officers, owing to not having sufficient time apart from their other multifarious duties, could possibly justify its existence by doing the work more thoroughly. The motion congratulating the Federal Government on its intention to establish such a bureau was negatived, as was also an amendment suggesting the confinement of such a bureau to scientific research, but in each case the margin of defeat indicated that since previous conferences the prejudices of fruitgrowers towards Federal projects are narrowing down.

A committee brought up a report outlining the grievances of the fruit trade in respect to inter-State traffic. This claimed there should be a uniform gauge of railways, with an adequate supply of louvred and insulated cars, and that the fruit in transit should be put down, not dropped. In regard to steamship transport they considered deck space, far removed from funnels, covered with awnings to allow a passage of fresh air should be available; and, further, laborers when loading cargo should walk on planks, not on the fragile fruit cases, padded against collapse only by the fruit they contained. All boats should have cold storage and dry air systems kept at temperatures, 45° Fahr. for northern and 34° Fahr. for southern fruits, and slats should be used between the layers of cases to permit the maintenance of a more even temperature throughout the hold. The fruit should be handled by trays in lieu of rope slings or nets, and the cases should be stowed on board and removed to the wharf more in keeping with the fragility of their contents. In the expressive words of the report the cases should be placed and not thrown or dropped into their places; and, lastly, the passengers should be prevented from broaching the fruit in transit. Truly a multitude of grievances; some, perhaps, crying out for that which is in store for the fruit dealers of the somewhat distant future only, but others again representing needs for reform which have raised the gorge of everybody who can view these matters in anything like a rational and fair-minded manner. Those who have witnessed the effects of the rough, thoughtless habits of the stevedore, and the immense losses of good fruit through unsuitable stowage provided on the coasting steamers can fully indorse the crying need there is for a little more of the spirit of the golden rule entering into the question of the carriage and handling of such a commonplace article as fruit.

Fruitgrowers are as much interested in " cases " as medical men or lawyers, and if the discussions at this conference represent the opinions of the trade they differ almost as much in what they believe to be finality. Again and again, year after year, this question has been debated at these conferences, and the arguments tend to flow in circles. Those, however, who attempted to introduce new sizes or capacities were crushed by the arguments of a well-known South Australian grower who held up to them the ridicule which confronts those persons who give evidence that they do not know their own minds. Certain sizes of cases were recommended by the conference which sat in Brisbane in 1911, and after being indorsed by the Sydney conference last year, were accepted by the conference of Ministers of Agriculture and embodied into Bills, some of which have already passed into law in certain States. Eventually it was resolved to stand by previous decisions and to recommend that all standard fruit case legislation should provide for new shapes or sizes being fixed by proclamation and not by Act, thus smoothening the way for reform as the needs arose.

Under the heading of " Stowage on Steamers " the question of the " dropping of fruit cases " again received attention, and it was claimed that Australian fruit would be worth at least 1s. per bushel more on arrival in Europe if it were carefully placed and not dropped in position by those " autocrats of the wharf," the lumpers.

The spirit of co-operation is making headway amongst fruitgrowers, as evidenced by the fact announced at this gathering that the growers of Victoria had decided upon a levy of so much per case of exported fruit being paid to send a representative to London to look into the disposal of their produce, and again the Federal Government is to be approached with the hat to bear half the expense on behalf of the rest of the States.

Regarding the question of dealing with nurseries and orchards in relation to diseases, the desirability of compelling all of the former to register was affirmed, but an attempt to compel orchardists to register was, to put it politely, declared to be best left in the hands of the various States. The mover of a motion which sought to exempt the exported produce of any orchardist who might be declared to have a clean plantation from the operations of the Commerce Act argued the matter from a position which does not, to my knowledge, exist in any State. It was carried by the conference in blissful innocence of what it really meant, or how it would be viewed by those who are conversant with the requirements of the Commerce Act in respect to diseases in exported fruits.

Motions were carried without much discussion to widen the operations of the parcel post as a means of distribution of fruit in small lots ; to standardize the by-laws in each State as to the purity of chemical reagents used as insecticides and fungicides; to compel nurserymen to supply trees true to name and worked on blight-proof stocks, and in keeping with this to ascertain the position of the laws in California respecting the control of nurseries ; to congratulate the Federal Government for its intention to exempt rural industries from the Arbitration Act; to ask the statisticians to use the bushel instead of the cental as a measure of capacity in which to express fruit trade statistics ; and to ask the Minister of Customs to amend the regulation concerning the San Jose scale, so that the export of only diseased fruits be prohibited and not all of the products of an orchard in which this scale exists.

Two valuable papers were contributed by Messrs. Sampson and Davey upon " Co-operative Packing " and " The Outlook for the Fruit Industry of Australia " respectively. The former not only advocated district co-operations, but uniform systems of packing, and there is evidence that the course advocated, which practically coincides with the lines recommended by this department for some time past, is gradually gaining acceptation on the part of the fruitgrowers who export their produce. Mr. Davey's paper was full of the possibilities for widening the markets for Australian fruits, which will arise with the opening of the Panama Canal route to the Gulf of Mexico and the Mississippi region of the United States of America, which is so densely populated.

The members of the conference, at the invitation of the South Australian Fruitgrowers' Association, made excursions through the orchard and garden areas of the Mount Lofty Ranges, and, through the courtesy of the Minister of Agriculture, looked over the Government Produce Depot at Port Adelaide and inspected the facilities for shipping produce afforded by the Outer Harbor.

On Saturday, October 25th, the last gathering of the conference consisted of a visit to the Government Experiment Orchard at Blackwood. The various tests and experiments were inspected with much interest, and it was generally agreed that the results eventually must prove of considerable value to the fruit-growing community.

DAIRY FARMING.

FODDERS FOR IRRIGABLE AREAS.

(By P. H. Suter, Government Dairy Expert.)

In irrigation areas possessing a liberal supply of water, good deep organic soil, a useful rotation of crops will be found in the following :—Oats. pasture, pasture, barley, millet, lucerne. This rotation has much to recommend it, seeing that it supplies a most valuable combination of fodders which, when fed in a suitable condition and in conjunction with a little concentrated food, will prove conducive to high milk yields. Again, as most of our soils are not too strong in humus content, the two years pasture, when fed off and turned under preparatory to the green barley crop, gives back to the soil that highly prized content, "humus," without which irrigation farming cannot be successfully maintained.

It is not an uncommon sight to find a continuous crop failing upon areas whereon water has been continuously used to promote growth. Thus, all persons engaged in the use of water for raising crops will do well to give serious thought to the addition of good pastures upon a portion of their irrigable areas.

The mixtures most suitable for two years pastures will be contained in the following :—(1) Rye grass (perennial) and cow-grass clover, prairie grass. (2) Italian rye grass and cow-grass clover, prairie grass; (3) rye grass (perennial), Alsyke clover, cow grass, prairie grass; and for wet land with bad drainage strawberry clover will thrive and do well.

There are many other grasses, such as Timothy, cocksfoot, Kentucky blue grass, which find their place under various conditions of soil and climate; but where irrigation farming is concerned the first-mentioned mixtures will succeed.

For winter feeding of dairy stock, green barley makes an excellent addition to the ration, stimulating the milk-secreting organs and keeping the cows working at high pressure. Barley on irrigable areas should be sown early—during January and February—and this when being fed to cows should have mixed with it some lucerne and oaten hay chaff. A dairy herd receiving sufficient of this mixture will continue to produce abundantly throughout the winter months. In addition to the above, I cannot too strongly recommend dairy farmers who are growing green crops on irrigated areas to sow down a portion with berseem (Egyptian clover). This most excellent fodder for dairy cows was introduced by Professor Perkins, who has during the last two winters fully demonstrated its high value as a fodder for dairy cows. It is a wonderfully heavy yielder under irrigation; several cuttings can be taken off an acre each season; it is relished by the dairy cows and does not taint the milk like freshly-fed lucerne. Cows receiving berseem immediately respond by an increase in their milk production, it having a very healthy effect in stimulating secretion. Cuttings of berseem at Roseworthy have yielded up to and over 10 tons per acre, and similar results have been obtained at a dairy farm near Adelaide.

Maize Growing under Irrigation.

Japanese millet sown during the spring will give a most useful crop for use during the summer months. This can be successfully grazed or hand fed. Cows relish it, and it promotes a very healthy flow of good milk, more especially when the plant has run well into maturity. The growing of this fodder has given excellent results in other countries possessing conditions similar to that obtaining over a wide area of this State; but little attention is given to its growth with us, whether on irrigable or non-irrigable areas. Farmers situated in the latter areas would do well to sow down a portion of their fallow, and with ordinary summer rains should have a good cut of green stuff; but where water can be applied the millet furnishes an amazing crop. The plant is a very hardy grower, and when sown through every hoe of the seed drill yields heavy returns per acre on irrigable lands. Should there be any surplus growth this can always be cut and bound and made into excellent hay which, when chaffed, is much relished by cows as well as horses.

The last crop in the rotation given is lucerne. This plant, where suitable conditions and soil obtain, has always proved a heavy yielder and excellent milk-maker. It also gives good food results on non-irrigable areas, especially where a fair spring and summer rainfall obtains. It is well called the king of fodders on account of its high nutritive value as a food which, when fed to dairy cows, quickly improves their milk flow. It is so well known that more need not be said of it, further than no cowkeeper should be without a small plot of it in almost any district in the colony. Nevertheless, it should not, as too many advise, be made the whole subject of irrigation farming. Whilst admitting its value as a milk-maker when fed in the green state, in my opinion it proves of greater value when used in co-operation with other crops, and the bulk of the lucerne crop reserved as hay. In this form its value is enhanced when used as a winter feed—preferably chaffed and fed in co-operation with oaten chaff and green barley. In the summer time the food ration of the dairy cows can be largely provided for from the pasture, Japanese millet, maize, and sorghums.

Seeing that this rotation can be arranged on our irrigable areas, I would recommend that the bulk of the lucerne be conserved as hay for the winter months, and then fed with oaten or wheaten chaff and green barley it will be unnecessary to run up a bran bill. To those who grow and feed lucerne the better method to adopt is to cut it instead of grazing ; for cattle, grazing will on most soils tend to destroy the plants, and the stand becomes weedy, stunted, and the lifetime shortened. The feeding-off with dairy cows is also not advisable, on account of the fresh green lucerne giving a strong taint to the milk, butter, and cheese ; whilst it may be added that an occasional loss of a cow by hoven or bloat is likely if hungry cows are turned on when the lucerne is wet. Such loss in this way would seriously affect the yearly profits of the dairy. There are conditions where lucerne fields can be successfully grazed, but this is not so upon irrigation areas where good pastures are laid down for this set purpose, viz., the lucerne conserved as hay and fed as above mentioned.

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DISEASES OF FARM ANIMALS.

TREATMENT OF WOUNDS.

By F. M. JONES, L.V.Sc., Assistant Government Veterinary Surgeon.

(*Continued from page* 300.)

OPEN JOINT.

This is a term used to indicate an injury to a joint, and usually accompanied by discharge of synovia, or joint oil. It may or may not be associated with fracture. If unaccompanied by fracture it usually shows little local or constitutional disturbance at first, but at the end of the second to the tenth day much swelling, with heat and pain, is present, the latter being shown by the animal trembling and sweating. The lameness is excessive, the animal being unable to place any weight on the injured limb. The amount of synovia or joint oil lost at first is only negligible, but increases as the inflammation advances. If treatment be delayed the animal usually dies from septic absorption. Joints most commonly affected are those of the foot, often caused by nail pricks ; fetlock, from kicks ; the knees, from falling ; the hock, from kicks ; and elbow and stifle, due to falling or kicks from other animals.

Treatment.—First rest the animal by relieving the weight of the body by means of slings. Carefully remove all dirt and other foreign matter from the wound, not by scarifying or probing, but by carefully irrigating the wound with lukewarm water, to which has been added some ordinary kitchen salt, *i.e.*, one teaspoon to the pint. Do not apply swabs direct to the wound, only press these above the wound in order to release the liquid contained. Irrigate with a solution of corrosive sublimate (1 to 1,000) ; use an enema pump and not swabs. Afterwards pack with a light pad of boracic lint. Feed light laxative food, to which has been added a plentiful supply of Epsom salts.

CHEST WOUNDS.

These injuries are fairly common, varying in degree from simple laceration of a superficial character to that of deep punctured wounds. The former are frequently caused by lacerations from barb wire, &c., whilst the latter are often due to collisions resulting in the penetration of a vehicle shaft into some part of the thorax or chest.

The treatment of the first class of injury is comparatively simple, and consists of carefully examining and removing all dirt or other foreign matter by thorough cleansing with warm water, to which has been added a little table salt, drawing the lips of the wound together and, if necessary, holding in position by means of a suture, afterwards dusting with boracic powder. The treatment of the second class of injury is by no means so simple, and requires skilful treatment. The treatment depends solely on the situation and extent of the puncture and the damage to the adjacent structures. Very little information of a practical character can be suggested here beyond urging the need for cleanliness at the seat of the injury—clipping of the hair around the wound, irrigating with water that has been boiled and allowed to cool, and to which has been added 1oz. salt to the pint. Remove any ragged edges about the wound, and afterwards irrigate with a solution of corrosive sublimate (1 to 1,000) twice daily. Care and attention should also be paid to the general bodily health, and diet should be of a light and laxative character.

The danger attending this class of injury, apart from actual structural damage, is the formation of pus inside and its consequent absorption, which will result in the death of the animal.

WOUNDS OF THE ABDOMEN.

Injuries in this region, apart from merely superficial scratches, are always regarded with apprehension. The great danger of abdominal wounds in animals is the possibility of intestinal protrusion. When one considers the great bulk of intestines which is supported by the abdominal coats the possible results of an injury here is not surprising.

Abdominal wounds may be divided roughly into two classes—shallow punctures and deep punctures. The shallow injuries involve the muscles, but do not penetrate through the whole belly wall. This is often followed by the formation of many abscesses. The pus forms here, and is not able to escape owing to the smallness of the wound, and consequently burrows its way down between the muscles and their covering. This is followed by pain and swelling, and at the same time abscesses may form in various parts which are hard to heal.

Treatment consists in enlarging the original wound after having carefully clipped the hair from the part and washed with an antiseptic. Inject into the part corrosive sublimate, strength 1 to 1,000. Always use an ordinary enema pump syringe for this purpose instead of swabs. Afterwards dress with boric powder. Diet on light laxative foods. To treat the deep punctures we must work with a definite object in view, namely, to prevent the escape of the intestinal loop down through the opening, at the same time we must allow the full escape of the wound discharges. The most practical suggestion is to take an ordinary bed sheet that has been soaked in a weak solution of carbolic and pass this around the animal's body, keeping it in position by sewing. This will act as a support to the weakened walls and at the same time allow of the escape of wound discharges. Constitutional treatment consists in relieving the bowels by enemas ; on no account should purgatives be administered.

WOUNDS OF THE EYELIDS.

This injury is not by any means rare. It consists of the laceration of the upper lid, and is generally caused by the eyelid being torn on a nail projecting from a stable wall or shed. The laceration may not be extensive, but if not treated surgically will result in a permanent blemish. In treating this injury do not by any means remove a part of the hanging lid. Every piece of tissue here must be preserved for the purpose of suturing. First secure the animal by means of a twitch ; in some cases it may be necessary to cast the patient. Then, after carefully bathing the part with a solution of boracic acid, gently bring the edges into apposition, and assure their remaining so by means of two or three stitches ; afterwards dress with boric powder. Tie the animal up short after the operation by means of a double halter, and allow him to stand with his head facing the door. This will ensure him not rubbing his head and so breaking the stitches.

KNEE INJURIES.

Broken knees is a term that suggests a condition familiar to everyone associated with horses. The cause is due to the severe blow received in falling on the hard ground. Sometimes the result is more serious than a mere breaking of the skin. Frequently the bursal or sac surrounding the joint, and containing the synovia or joint oil, is injured to such an extent as to allow the escape of the oil. Again, as is often the case, the animal in falling slides on his knees and tears the lower lip of the wound in such a way as to form a pocket. Into this pocket collects the gravel or dirt upon which the animal may have fallen, and so is furnished material for further complications.

Treatment.—First obtain clean, tepid water, to which has been added boracic acid. Take a swab of cotton wool, immerse in water, and then place it, not on the wound, but above. Press so that the contained liquid will irrigate the wound below. Repeat this operation until all dirt and foreign substance has been removed. Should there be a pocket present take a sharp penknife and carefully slit a small hole in the bottom of the skin ; this will provide drainage for the wound. Afterwards pack up the wound for two days with the following :—Zinc sulp., 1oz. ; lead acetate, ½oz. to pint of water. Subsequently remove the bandage and treat as an open wound, using a dusting powder of boric powder. Care should be taken to tie horse up short and away from anything upon which he might rub the injured limb.

(*To be continued.*)

POULTRY NOTES.

By D. F. Laurie, Government Poultry Expert and Lecturer.

OPERATIONS FOR NOVEMBER.

Incubation.—No further attempt should be made to hatch hens' eggs. Late-hatched chickens are not worth rearing. A few duck eggs may be set; the ducklings will be available for autumn sales. Turkeys' eggs may still be incubated, as the chicks grow well during the warm weather if properly fed.

Green Food.—Attend to the growth of kails, silver beet, &c. Sow maize at intervals; cut when about a foot high. This green food is much relished.

Shade.—Erect shades for the birds. Galvanized iron covered with two coats of King's compo. is everlasting. Sacking coated with the same compo. will last a couple of seasons and is cool.

The Young Stock.—Separate the sexes. Fatten and sell all culls and surplus cockerels. Keep the young stock growing; feed carefully, and give as much succulent green food as possible. Keep a supply of grit (gravel, shell, and charcoal) under cover where the birds can have easy access to it. Look carefully to the water supply. Keep the vessels in absolute shade; scald at intervals and use a disinfectant, such as copper sulphate 1oz. to the gallon of water. Use this to rinse the water vessels.

The Breeding Pens should be broken up. House the male birds in pens by themselves. Go carefully through the stock and cull out any which are not satisfactory.

Eggs for Market.—Gather these twice daily and store in a cool cellar. Wash all soiled eggs before sending them to market. Remember the value of appearance in all produce.

THE 1914-15 EGG-LAYING COMPETITION AND PUBLIC SINGLE TESTING.

The Hon. Minister of Agriculture has approved a further series of tests to begin on April 1st, 1914. There are various new features, and the tests will be organised as follows :—

Section 1.—Open to the world. Any breed ; 10 pullets will constitute each pen. Entry fee, 10s. Prizes—£10, £5, £3, £2, and £1.

Section 2.—Open to those engaged as farmers, pastoralists, fruit and vegetable growers in the State. Any breed ; 10 pullets in a pen. Entry fee, 10s. Prizes—£7, £4, £2, £1, and 10s.

Section 3.—Single testing, light breeds only. Fee, £1 for each entry of six (6) pullets. Prizes—£5, £3, £2, £1, and 10s ; special prize, £2 2s., highest aggregate points. Limited to 30 entries.

Section 4.—Single testing ; general purpose breeds. Limited to entries from the General Purpose Poultry Society and forming part of extended breed test. Fee, £1 for each entry of six (6) pullets. Prizes—£5, £3, £2, £1 and 10s. ; special prize, £2 2s., for highest aggregate points. Limited to 30 entries.

Regluations and entry forms are in course of preparation, and may be had on application to the Poultry Expert on or after November 10th, 1913.

Government Produce Export Depot.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, to terminate March 31st, 1914.]

Competitor.	Eggs Laid for Month ended Oct. 31st.	Total Eggs Laid from April 1st, 1913, to October 31st, 1913.
SECTION I.—LIGHT BREEDS.		
WHITE LEGHORNS.		
Hurford, E. W., Grangeville	127	751
Hammill, H., Kogarah, New South Wales	144	774
Carter, A. A., Keswick	143	572
Robins, G. W., Hawthorn, Victoria	155	793
Dunn, L. F., Keswick	153	732
McKenzie, H., Northcote, Victoria	138	822
Cowan Bros., Burwood, New South Wales	122	723
Robbins, G. W., Hawthorn, Victoria	124	676
Pettigrove, T. A., Northcote, Victoria	136	747
Eckermann, W. P., Eudunda	147	589
Robertson, F., New Hindmarsh	151	586
Pettigrove, T. A., Northcote, Victoria	103	762
Cant, E. V., Medindie	125	656
Schäfer, N. H., Strathalbyn	133	763
Redfern Poultry Farm, Caulfield, Victoria	134	708
Chapman, G. H., Port Pirie	101	482
Lewis, F. M., Caulfield, Victoria	141	646
Redfern Poultry Farm, Caulfield, Victoria	143	793
Hagel, W. C., Mallala	136	696
Hocking, E. D., Kadina	132	570
Sargenfri Poultry Yards, East Payneham	139	685
Joass, W. A., Rothbury, New South Wales	143	717
Bennett & Furze, Wright Street, Adelaide	129	688
Jury, W. H., Torrensville	134	707
Olive Poultry Farm, Freeling	151	705
Kelly, Mrs. W. J. L., Quorn	102	409
Indra Poultry Farm, Freeling	155	888
Electricum Poultry Yards, Glenelg	112	669
Sargenfri Poultry Yards, East Payneham	144	787
Moritz Bros., Kalangadoo	151	797
Brown, S., Gembrook South, Victoria	122	760
Matthews, H. G., Fullerton	152	761
Harris, J. G., Black Forest	152	771
Tockington Park Poultry Farm, Grange	121	744
Bradley, J. E., Newport, Victoria	139	836
Miller, B., Parkside	124	592
McKenzie, E., Northcote, Victoria	160	893
Tockington Park Poultry Farm, Grange	159	784
Provis, W., & Son, Tumby Bay	143	755
Hillcrest Poultry Farm, Brighton, Victoria	130	752

EGG-LAYING COMPETITION—*Continued.*

SECTION I.—LIGHT BREEDS—*Continued.*

WHITE LEGHORNS—*Continued.*

Competitor.	Eggs Laid for Month ended Oct. 31st.	Total Eggs Laid from April 1st, 1913, to October 31st, 1913.
Beadnall Bros., Gawler	136	598
Morgan & Watson, Frankston, Victoria	149	864
Gibbs & Pine, Queenstown	124	508
Hillside Poultry Yards, Hamley Bridge	119	577
Hall, A. W., South Oakleigh, Victoria	157	692
Dreyer, G. H., Wolfram Street, Broken Hill	138	764
South Yan Yean Poultry Farm, Doreen, Victoria	162	730
Pope, R. W., Heidelberg, Victoria	147	843
Tabuteau, J. O., Black Rock, Melbourne	104	656
"Koonoowarra," Enfield	126	628
Hagger, J. C., Orroroo	153	750
Bertelsmeier, C. B., Clare	125	702
South Yan Yean Poultry Farm, Doreen, Victoria	157	724
Jelliff, Mrs. T., Beverley, Adelaide	144	765
Hughes, J. J., Elsternwick, Victoria	153	639
Stewart, J. R., Thirlmere, New South Wales	117	609
Aveling, T. B., Quorn	114	496
"Nunkerowi," Neales Flat	119	518
Prior, D., Moonta Mines	131	598
Leonard, W. J., Port Pirie	149	629
Barkla, L. W., Gawler South	118	592
Foreman, E., Hindmarsh	152	635
Broderick Bros., Gawler	130	548
Tubb, E. C., Frewville	123	554
Harfield, B. L., Pinnaroo	134	568
Foreman, E., Hindmarsh	139	617
Tomlinson, W., Westbourne Park	147	703
Woodhead, H., Torrensville	147	753
Padman, A. H., Hyde Park	141	708
Franklin, G., Norwood	102	759
Mathias & Weller, Unley	134	576
Messenger, A., Port Adelaide	150	733
Albion Poultry Farm, Magill	123	713
Dunstan, L. A., Port Pirie	127	604
Trenwith, T. H., Kadina	127	540
Purvis, W., Glanville	155	754
Rice, J. E., Cottonville	135	678
Evans, H. A., Richmond	126	601
Miels, C. & H., Littlehampton	139	705
Swift, W. G., Northcote, Victoria	146	768
Bertelsmeier, C. B., Clare	73	690
Brundrett, S., Moonee Ponds	126	618
Glenelg River Poultry Farm, Mount Gambier	95	649
Padman, A. H., Hyde Park	138	651
Purvis, Miss Gracie, Glanville	129	626
Braund, J. E. & H. J., Islington	149	633
Ontario Poultry Farm, Clarendon	113	515
Brock, A. G., Hamley Bridge	138	558
Russell, E. L., Salisbury	137	653
Schwabl, J., Elsternwick, Victoria	137	685
Moritz Bros, Kalangadoo	100	696

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended Oct. 31st.	Total Eggs Laid from April 1st, 1913, to October 31st, 1913.
SECTION I.—LIGHT BREEDS—*Continued.*		
WHITE LEGHORNS—*Continued.*		
Craig Bros., Hackney	148	633
Codling, H., Mitcham Park	87	477
Tidswell, H. J., Clarence Park	115	481
Bennett, E. V., Kalangadoo	118	651
Lillywhite, R. G., Malvern	136	580
Harris, A. W., Mallala	131	682
Hagger, W. H., Malvern	86	709
Winter, W. C., (Nalpa), Strathalbyn	58	429
Whitegate Poultry Farm, Deepdene, Victoria	148	631
BROWN LEGHORN.		
Toe, C. E., Brighton, Victoria	114	334
BLACK MINORCA.		
Whitrow, A. J., Knoxville	126	549
SECTION II.—HEAVY BREEDS.		
BLACK ORPINGTONS.		
Neville, A. B., Fullarton	103	610
Thornton, W. J., Kew, Victoria	108	588
Kenway, D., West Pennant Hills, New South Wales	130	799
Martin, B. P., Unley Park	119	674
Cowan Bros., Burwood, New South Wales	130	649
Tockington Park Poultry Farm, Grange	126	568
Pearson, W. S., Kingswood	114	550
Hall, A. W., South Oakleigh, Victoria	94	557
Padman, J. E., Plympton	122	611
Greaves, W. E., Prospect	118	399
Bertelsmeier, C. B., Clare	80	342
Coto, T. W., Myrtle Bank, Victoria	134	677
Convent of the Good Shepherd, Oakleigh, Victoria	135	536
BUFF ORPINGTONS.		
Hocart, F. W., Clarence Park	114	507
SILVER WYANDOTTES.		
Dunn, L. F., Keswick	101	645
Western, F. C., Marion	113	468
Kappler Bros., Marion	73	474
WHITE WYANDOTTES.		
Bradley, J. E., Newport, Victoria	125	620
BLACK LANGSHANS.		
Stevens, E. F., Littlehampton	112	555
FAVEROLLES.		
Williams, W. H., Frewville	109	401
DORKINGS.		
Cathcart, J. F., Newburg, Scotland	110	421

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended Oct. 31st.	Total Eggs Laid from April 1st, 1913, to October 31st, 1913.
SECTION III.—PRODUCERS.		
Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.		
WHITE LEGHORNS.		
Broster, G., Mallala	111	674
Carling, R., Kangaroo Flat	146	751
Rowe, J., Long Plain	154	681
Broster, G., Mallala	118	684
Gilbert, F. W., Kangaroo Flat	141	771
Campbell, J. D., Barabba	137	717
Forest Leigh Poultry Farm, Jamestown	89	572
Kerr, R., Longwood	142	706
Carling, Mrs. R., Kangaroo Flat	143	752
Rowe, J., Long Plains	150	686
Gill, R., Marrabel	115	580
Wurst, G. H., Marrabel	149	651
Sherrah, E., Long Plain	132	619
Rowe, N., Long Plain	142	686
Shepherd, R. H., Balaklava	149	634
Lacey, F. C., Kybybolite	91	675
Bertelsmeier, O. O., Booborowie	120	667
Dunn, H. J., Black Springs	116	538
Rackham, C. Naracoorte	142	761
Holmes, F. A., Naracoorte	95	558
Hutchison, W. J. S., Naracoorte	91	450
"Herdsfield," Mount Gambier	121	784
Smith, R. L., Hynam	122	519
Gill, Mrs. J., Kapunda	133	552
Sampson, C., Kooringa, Burra	162	759
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	63	406
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	95	582

D. F. LAURIE, Poultry Expert.

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PARAFIELD EGG-LAYING COMPETITION.

MONTHLY REPORT.

HEALTH.

The health of the birds has been good, and their appearance at the present time indicates that their condition is satisfactory.

DEATHS.

Five deaths have been recorded for the month, as follows :—Four from Section 1—one from cystic disease, one from cannibalism, two from natural causes = 4 ; and one from Section 3, caused through cannibalism.

Judging by a statement which recently appeared in a poultry publication, there seems to be some misapprehension about cannibalism. Cannibalism is not due to errors in feeding, but is without doubt a distinct vice which seems to be inherent in certain strains. I have many records of serious outbreaks, even where the birds had unlimited range in scrub country. This year the trouble has been confined to one or two pens, in which the vice seems hereditary.

BROODINESS.

During the month 84 cases of broodiness have been recorded. Section 1 provided 14 White Leghorns and one Minorca ; Section 2, 29 Black Orpingtons, three Buff Orpingtons, 13 Silver Wyandottes, three White Wyandottes, four Langshans, and two Dorkings ; Section 3, six Black Orpingtons, three White Leghorns, and six Langshans = 84.

EGG PRODUCTION.

There is a slight falling off in the production for the month ; this is seasonable. The 900 birds have averaged over 600 eggs a day for the last three months, or 593·5 for August, 648·9 for September, and 622 for October - a daily average for 92 days of approximately 621·5. Highest monthly score—Section 1, 162 ; Section 2, 135 ; Section 3, 162.

VISITORS.

During the month 40 visitors have inspected the station, making a total of 456 since the 1st of April.

WEATHER.

The weather during the month has been cool and moderate, with even temperatures. Rain fell on seven days ; total precipitation of 2·20.

FODDERS.

The following varieties of green fodders, viz., lucerne, barley, oats, rye, kale, silver beet, sorghum, and maize are making good growth, and should prove ample for all requirements.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, October 1st, the following members being present:—Messrs. G. R. Laffer (Chairman), A. M. Dawkins, C. J. Valentine, G. Jeffrey, C. J. Tuckwell, J. Miller, W. G. Auld, Col. Rowell, Professors Lowrie and Perkins, and G. G. Nicholls (Secretary).

Board Membership.

The Secretary stated that in reply to the resolution from the Conference of West Coast Branches of the Agricultural Bureau, to the effect that the Branches should have a voice in the election of the members, the Minister of Agriculture had stated that, as the board was advisory to the Minister, the selection must remain with him.

Timber on Mount Remarkable.

The following communication from the Conservator of Forests was read by the Secretary:—"Reference to the previous correspondence will show that the matter of the destruction of timber on Mount Remarkable has been dealt with in an exhaustive manner, and a special resolution has been passed to that end. There is, in my opinion, no necessity to resume any leases now existing, because should a lessee commit any breach of the conditions under the regulation the lease can be forfeited. This department will, with the approval of the Minister, prosecute all offenders on sufficient evidence being forthcoming regarding the lighting of fires contrary to regulation." It was decided to send a copy of the letter and regulation to the Mount Remarkable Branch.

Sheepdips and Saleyards.

It was announced that the following report on the question of establishing sheepdips at saleyards in the country districts had been received from the Chief Inspector of Stock (Mr. T. H. Williams):—"The Government has no power under the Stock Diseases Act or regulations to compel firms to construct sheepdips at saleyards. It is questionable whether all public saleyards would be desirable localities for dips. Corporation and district authorities might, with good reason, object to have sheepdips within town boundaries. It is a breach of the regulations for owners of tick or lice infested sheep to expose them in a saleyard, and it is doubtful if it would be wise to provide dips where they might prove an inducement to careless owners to bring their sheep in. It would be far more profitable to sellers to bring in clean animals for sale. If there is not a sufficient number of dips in a district owners should club together and construct company dips." At the suggestion of Mr.

Jeffrey it was decided to send a copy of the report to the Strathalbyn Branch, which had moved in the matter, with the indorsement of the Board.

MARKETING WHEAT.

The appended resolution adopted by the recent Farmers' Congress was placed before the Board :—"That this Congress urges the Government to take such steps as may be necessary to make bulk handling the ordinary process of marketing wheat in this State." After discussion the Board determined to forward the resolution to the Minister of Agriculture, with a suggestion that he should bring it under the notice of the Premier, with a view to its discussion at the conference of State Premiers.

CONFERENCE MATTERS.

The Secretary reported that resolutions had come to hand from the Whyte-Yarcowie and Gladstone Branches suggesting that all speakers at the annual Farmers' Congress in Adelaide should speak from the platform, and agenda papers should be distributed earlier than usual, so that the delegates might be armed with the feelings of their Branches in respect to the various subjects. The resolutions were received, and filed for consideration by the committee entrusted with the arrangements for the Congress.

NEW MEMBERS.

The following gentlemen were admitted as members of the Branches shown, viz. :—Frances—W. R. Hill; Mallala—W. Curnow; Port Broughton —A. J. Fletcher, C. W. Rantley, T. Pulford; Inman Valley—J. Millard, J. Mitchell; McNamara Bore—J. D. Robertson, T. Robertson, L. G. Perriam, E. C. Blackett; Moonta—G. Morris, M. McDowall, F. Shaw; Tintinara—W. Taylor; Ironbank—G. Justice, T. Wescombe; Butler—A. S. Bawden; Amyton—T. Corcoran; Mitchell—S. Baker, H. Voumard, R. Merchant, P. Green; Gumeracha—F. Redden; Meningie—W. Williams, H. Fleet; Wepowie—P. Burns, J. Burns, J. McMahon; Roberts and Verran—G. Pellew; Mount Pleasant—B. Giles; Morphett Vale—W. Leare, K. Rainsford; Wirrabara—E. H. Piper; Berri—T. Spinks; Yadnarie—P. Breise, J. Kruger; Lameroo—J. Kakoschkie, A. Townsend; Kanmantoo—H. Downing, A. Stewart; Redhill—H. Larcombe, R. Dick; Mundoora—J. W. Barnes, A. Browne, G. F. Johnson; Claypan Bore—L. McCormick; Bandon—R. Crook, D. Crook, A. Dohse, jun., R. Manning; Port Germein—G. H. Ragless, N. A. Ragless, R. O. Hanna, P. Blessing.

LIFE MEMBERS.

The distinction of Life Membership was conferred upon Messrs. H. A. Giles and F. Thompson in recognition of extended valuable service for the Bureau in connection with the Mount Pleasant Branch.

THE AGRICULTURAL BUREAU.

TWENTY-FIFTH ANNUAL CONGRESS.

(*Continued from page* 390.)

Wednesday, September 10th.

Congress resumed at 9·30 a.m. on Wednesday, September 10th, there being a large attendance of delegates. The Chairman of the Advisory Board of Agriculture (Mr. G. R. Laffer) presided.

THE MANAGEMENT OF FARM HORSES.

Mr. R. E. Lines (Gladstone) read a paper on "The Management of Farm Horses" as follows:—

In the management of horses, stabling is one of the first factors to consider. It is necessary to provide a good, comfortable stable with plenty of yard room. The stable should be closed in on three sides, the open side to face the north-east. It is important that the stable and yard be well drained. The roof may be constructed of iron or straw, according to the farmer's finances. While iron looks better and is safer against fire, a straw roof is cooler in summer and warmer in winter, and is very cheaply constructed. The stable should be provided with a good, roomy manger. When given plenty of room, the horses agree better. I prefer to give them their liberty in preference to cooping them up in small stalls; then, when not feeding, they can go out into the fresh air if they choose. Then, when one comes to harness them in the morning their legs are not puffed up to about the size of two, which happens when they are cooped up in small stalls.

Feeding.

We all know a horse cannot work unless it is well fed. I give long hay in the summer when not working too hard, as I think it keeps the horse in better health; but if working hard they must have chaff and corn of some kind. A little long hay may be then given for the last meal at night. It is best to have different varieties of corn for summer and winter. I prefer bran and crushed oats in the summer, and bran and crushed wheat or barley for the winter. The wheat and barley are very heating; but in the winter a horse requires a certain amount of heat-producing food to keep its blood warm and keep it in condition. A practice too common on farms is to turn horses out in the paddocks where there is very little feed when they are not working, for instance, on Sundays and other off days. At such times they should be fed in the stable, as they require rest and time to build up lost condition. Perhaps there is a little green picking in the paddock which some men say is as good as a dose of medicine. They forget the bad effect it has on the horses' appetites. It will put them right off the feed that has the staying powers, namely, chaff and corn. Eaten out stubble paddocks are also very bad for horses to graze on. They pick after the loose grains of wheat and gather up a lot of dirt which causes a stoppage of the bowels. I have seen many a valuable animal lost in this way.

Water.

Horses should have pure drinking water. Well water is preferable, as it is always clean and usually contains a little salt. If dam water has to be used, see that no drainage from any yards gets into it, as it is from such filth that the dreaded blood worms usually come. If horse owners watch these little points they will find they require very little in the way of drugs, and the horses will be healthy.

Harness.

The harness, especially the collars, should be looked after, and I prefer the collars left in the straw state as long as possible, as they are smoother and more level than when stuffed with the inferior hair of the present day, which, after a while, becomes lumpy and causes the horse to bruise its shoulders when pulling hard. The best of all remedies for chafings and bad shoulders is to keep the horse in first-class condition; if this is done the owner will have no trouble with his horses' shoulders. The driver can often prevent what might be a bad shoulder if he is careful, as soon as he sees the horse start to chafe, to simply alter the draft of the hames one way or the other, or to buckle up the collar a little.

The Discussion.

Mr. J. Malcolm (Kadina) said the writer of the paper had not referred to the necessity of well grooming. He (the speaker) thought it was just as essential that farm horses should be well groomed as it was that buggy horses should be.

Mr. J. Scriven (Morchard) asked whether Mr. Lines had any proof that blood worms came in any way from dams:

Mr. J. P. Pontifex (Paskeville) complimented the writer on his admirable paper, but took exception to the statement that many farmers turned their horses out in paddocks where there was little feed on Sundays and other off days. He had always adopted the plan of turning his horses out, as he believed the exercise they got in the paddock was good for them. Of course that was when there was a good picking in the paddocks.

Mr. R. Johnston (Roberts and Verran) thought farmers were rather prone to neglect grooming their horses properly. They would find if they groomed the horses well before starting work in the morning they would have little trouble as regards sore shoulders.

Mr. W. Rice (Gawler River) said he had visited Roseworthy College when fallowing was in progress, and had noticed that when the horses were brought in the hose was turned on and they were given a good wash down. He asked if that was beneficial.

Mr. J. Burgess (Tarcowie) thought one cause of sore shoulders was that some farmers did not pay sufficient attention to the draught of their implements. If they looked into that matter they would find that it caused more damage to a horse's shoulders and withers than they were aware of.

Mr. H. H. Giles asked if a farmer had 20 or 28 horses would the writer recommend that one yard be used for the lot, or would he have separate yards, as there were all kinds of horses—old, timid, quiet, vicious, &c.

Mr. S. Bottrill (Narrung) did not think it advisable that a number of horses should be fed from one manger, as very often some horses on being put in the stable after working would lie down, and the other animals got all the food.

Mr. W. H. Smith (Naracoorte) said he made it a practice to tie up his horses, always using a strap instead of a rope. Then in case of fire or anything else happening the animals could break the strap and get free. Tying up the horses also ensured each getting its proper share of feed, and resulted in a saving of time. He preferred to feed oats in winter, and not in the summer.

Mr. P. J. Edwards (Pinnaroo) always turned his horses out on Sundays and holidays, and had found it beneficial. His horses ate more on Sunday nights, after being in the paddock, than they did on other nights.

Mr. W. Whibley (Booleroo Centre) said that years ago he used to tie his horses up, but had found that a better plan was when breaking horses in to train them to come when called, or at least to turn round in their stalls. He had also found it advisable to groom the horses in the summer months when feeding them last thing at night. If the sweat was left on all night they would be a little stiff and rough in the coat the next morning.

Mr. J. Monfries (Gumeracha) said a good grooming was to a horse as good as a bath to a man. Regarding sore shoulders, he had had 25 years' experience as a settler, and was of opinion that in regard to sore shoulders a great deal depended on the individual farmer. He believed in tight, well-fitting collars for every horse, and the collars should be kept clean. Some horses, however, it was impossible, owing to their temperament, to keep free from sore shoulders. In such cases the best thing to do was to get rid of them.

Mr. R. D. Nicholls (Nantawarra) thought it wise to have a big yard with posts erected in it, so that the horses could scratch themselves against them. (Laughter.) They should also be provided with a place where they could have a good roll.

A delegate did not favor cleaning horses down, but believed in cleaning their shoulders. When a horse was cleaned down he straight away had a roll, and that showed that he liked plenty of mud on him. Sore shoulders were often caused through the traces not being of the same length.

Mr. E. E. Gill (Spalding) said his practice was to have a stall for each horse. He turned his horses out each day and found they benefited by it. If a horse was tied up he could not lie down in comfort.

Mr. N. M. Roberts (Coorabie) asked whether Mr. Lines favored watering horses before feeding. In his opinion it was very injurious to allow them to have much water after feeding.

Mr. G. Hunter (Watervale) differed from the writer of the paper in regard to the use of straw collars. He had always found lined collars better. It was advisable to wash the horses' shoulders with cold water after removing the collars.

Mr. M. A. Neville (Wilkawatt) said it was impossible to keep a whole team entirely free from sore shoulders all the year round in the mallee districts, and that especially applied when the share plough was used. He had found it beneficial to wash the shoulders with warm water and a little washing soda. Some farmers plastered the shoulders with lard or blacklead, &c., but the dust adhered to the plaster and made matters worse. He used false kip collars and found them of great benefit.

Mr. J. B. Beck (Wynarka) said he had ploughed 100 acres, and hardly one of his horses had a sore shoulder. That was due to washing their shoulders and to the use of spring tugs on the chains for a week or two when a horse showed signs of scalding.

A delegate said the best thing to do in the case of a riding horse having a sore back was to take old blueys and stuff them with hair, leaving a hollow where the sore was, and put them under the saddle. The same principle should apply in the case of sore shoulders.

Mr. W. B. Russell (Loxton) was a strong advocate of good grooming. Lots of cases of sore shoulders were caused more through the collars not being groomed than from the horses not being groomed. Another cause was the chains being of unequal length.

Mr. W. J. Sears (Forster) had found that a good way to prevent sore shoulders was to wash the shoulders, if liable to scald, with salt and warm water.

Mr. A. Jamieson (Yongala) was of the opinion that the most prolific cause of sore shoulders was the fact that the implements were generally underhorsed.

Mr. W. J. Booth believed that a lot of farmers overfed their horses. He believed in quality rather than quantity. He would like to know what was considered a fair quantity of corn to give a horse.

Mr. Lines, in reply, said he had a fairly large stable, and never had horses with sore shoulders. He did not groom his horses, because doing so opened the pores of the skin, and the animals were then liable to catch cold. He, however, believed in grooming the shoulders, though he did not follow that practice to any great extent. He agreed that in many instances implements were underhorsed. He never lined the collars until they needed it, because the hair became lumpy. Veterinary Surgeon Desmond had said that blood worms were caused through filth being washed into the dam from which horses drank. Experience had taught him that it was better to tie up the horses. He advocated allowing one hour for breakfast and a quarter of an hour more for dinner. Horses should be watered before feeding, and the bit should be left in the mouths to prevent them gulping the water down. Observation would show that the horses of a man who kept them in poor condition always had sore shoulders. He would not give more than half a gallon of corn at a feed.

Mr. Place (Government Veterinary Lecturer) congratulated Mr. Lines on his paper, which was essentially a practical one. The ideas were those of a man who could back up what he said by what he had to show. The best situation for the stable was one sheltered from the prevailing winds, whether they were hot or cold. He was inclined to think that it was not advisable to spend a lot of money on them, because as time went on it might be advantageous to change the situation, possibly on account of the accumulation of dung, which provided a home for large numbers of worms and flies, both of which were dangerous to the health of the animals. Where they were obliged to water from dams they should rig up a filter to protect the horses from blood worms. There was no doubt that horses loose in the stalls were able to move around freely and did better than those that were tied up. At Roseworthy the stables were so divided that two or more of the horses could be secured without going into the whole mob. It was not advisable to have more than 16 horses running together. Theoretically, watering should be done before feeding, but so far as the early morning watering was concerned little harm would be done by giving it after the morning meal. Barley was one of the best feeds for bringing a horse up to sale condition, but it was not so good for hard-working condition, for which oats were best. There was no objection to the reasonable feeding of wheat—they could very well give two-thirds of a gallon of old wheat per day per horse. New grain would be found to disagree with the animals. When they were losing condition it would be found that the collars fitted badly, and sore shoulders would very likely result. It was a good idea to provide two collars for each horse when practicable. In any case it was better to pad the collar than to cut it. A piece of thin zinc could be advantageously placed over it. The value of grooming was very considerable, but it was better to leave it alone than to half do it. If the horses had the opportunity of rolling and shaking they would clean themselves. A rotary brush could be fixed on to the hand-clipping machine, and one boy and one man could with this clean eight horses in well under half an hour. He did not hold with hoseing the animals. Every stride the animals took when they were tired took more out of them than three steps when they were fresh; therefore it was not advisable to work them after sundown, and the longer they were given for meals the better.

MANURES IN RELATION TO VINES.

Mr. H. E. Laffer, Lecturer on Viticulture and Fruit Culture, Roseworthy College, read the following paper on "Manures in Relation to Vines":—

The subject I have chosen to put before Congress is one that will have to receive increasing attention in South Australia. Within the last three years the area under vines has increased from 23,000 to over 25,000 acres. At the last vintage 3,974,838galls. of wine were made and 52,208cwts. of currants and 16,575cwts. of raisins were dried. The quantity of wine exported overseas in 1912 was 461,414galls., and the quantity sent to the other States was over 5,000,000galls. The total value of the vineyard production last year was estimated at £544,200, the value per acre of vines of bearing age being £25 9s. 9d. On those figures, I think, I can claim that the grape-growing industry is one well worthy the attention of Congress.

The wisdom of judiciously feeding the vine with a view to obtaining heavier yields of fruit is probably occupying the mind of the Australian vigneron more fully at the present time than it has ever done before. It can safely be said, however, that, so far as Australian viticulture is concerned, manuring is only in the experimental stage. This will, to a large extent, account for the lack of reliable data on the question, and also for the somewhat contradictory nature of some of the results which are obtainable. When it is considered that the average yield for South Australia for the past five years was only 1·75 tons per acre, it will readily be understood that there is ample scope for improvement.

If we look to the older winemaking countries of the world we find, on the one hand, those who regularly resort to manuring of their vines as a part of the ordinary culture based on commercial principles. Of these, we find such as are carrying on the industry in those areas devoted to the production of table fruit, raisins, and currants, or those heavy-bearing varieties used in the production of the inferior types of wine. On the other hand, there are those who do not practise manuring because their ancestors did not do so, and those who do not openly admit the fact owing to an inborn fear that such an admission would adversely affect the sale of their wines. Amongst the latter we find the northern districts of France, where the finest wines of the world are produced. The reason for such an attitude towards the use of manures may be summed up in the fact that their use, momentarily at any rate, increases the fertility of the soil bringing it nearer to that of the rich soils from which the inferior types of wine are made; also, it is contended by some that the use of fertilisers would impair the quality of the wines which command such fabulous prices. This assertion, however, deals with only one aspect of the case, namely, the amount of available plant food in a given soil. It must be remembered that, in the richer types of soil, the percentage of available moisture must harmonise with the increased fertility of the soil, otherwise no increase in the vitality of the vines would be perceptible. The finest wines of the world are grown upon soil which, from an agricultural standpoint, may be considered poor, and with a rainfall varying from 20in. to 25in.

If, then, we enrich the soil in plant food readily available to the vine without increasing the moisture supply, it is unlikely that the quality of the wine will be impaired, except from a sentimental standpoint. The fertility of any given soil must be gauged, not by its percentage of moisture, nor by its supply of available plant food, but by a combination of the two factors. So far as the Australian wine trade is concerned, the question of ancestral sentiment has not to be considered, and the point to be solved is whether manuring will pay or not. It is clearly evident that 100 tons of grapes from 50 acres of vines is a much better paying proposition than a like amount from 75 acres, and this is the point from which the matter must be considered, namely, increased returns from smaller areas.

Manuring to be profitable involves a little more than actual cost of the manures, for it means that greater care and better cultivation must be given to the smaller area in order to secure an increased weight of fruit.

In advocating a system of vineyard manuring, it is not to the fertile soils of the river lands nor to those choice localities devoted to the growth of table fruits that we look for increased returns, but rather to the less favored districts, where the bulk of the wine varieties are grown. Even in the former, however, it is a matter of doubt as to whether the rich soils, with their strong, robust vines, are yielding their maximum of profit to the growers.

MAIN ELEMENTS REQUIRED.

We may sum up the main elements which contribute to the fertility of the soil, and with which manuring is chiefly concerned, as nitrogen, phosphoric acid, potash, lime, and organic matter. The three former are largely consumed by the vine as essential to good growth and fruit production; and the fourth one, lime, as a necessary food, but more particularly as a corrective to the physical nature of the soil. In the greater part of the South Australian vine-growing areas we may say that nitrogen is deficient, potash is fairly plentiful, and phosphoric acid is deficient if heavy yields are to be maintained. Nitrogen is conducive to luxuriant growth, potash to heavy fruit production, and phosphoric acid to the general health and vitality of the vine and, it is said, to quality in wine. The latter element is taken up by the vines in much less quantities than any of the others.

In the bulk of our vineyards organic matter is deficient, and there is no doubt that the raising of the proportion of humus in the soil will materially assist in overcoming other apparent deficiencies. In fact, it may be said that the question of increasing the proportion of organic matter in the general run of the vineyards is of greater importance than the application of either phosphoric acid or potash, and I will therefore deal with this branch of the subject first. Apart from its actual chemical and physical effect as a soil constituent, the moisture-retaining capacity of any soil is in direct ratio to the percentage of organic matter present. Therefore, if some efficient system of manuring can be practised whereby organic matter is added in such a condition that it is readily incorporated with the soil, apart from its action as a source of plant food, it increases the fertility of the soil by maintaining a more even supply of moisture. To this end the use of organic refuse of any description in a decayed state can be recommended, and one of the best known sources of this is stable or farmyard manure.

Green Manuring.

This commodity, however, is available only in limited quantities, and therefore applicable only to small areas. In addition, the general type of stable manure is not in a form which readily decomposes in the soil except with a large amount of moisture. Thus we find that the only practicable means of applying organic matter to large vineyards is by growing special crops within the rows and ploughing them in as green manure. For this purpose, one or other of the leguminous crops may be chosen, that of greatest utility being peas, with vetches as second best. This practice has several points to recommend it—First, the crop is grown generally with a dressing of artificial manure as superphosphate or potash; second, the crop enriches the soil in atmospheric nitrogen through the agency of its nitrogen-gathering bacteria; third, there is a heavy bulk of green matter ploughed into the soil which has the advantage of being heavily charged with moisture. Thus, it can readily be understood that a crop of peas ploughed in under these conditions represents the equivalent of good farmyard manure. As an additional recommendation it is in a form leading to its rapid decay, even in comparatively dry conditions, and hence rapidly becomes available as plant food.

For districts of low rainfall this practice of green manuring should be of great importance in viticulture, and to this end special provision might be made in planting young vineyards to facilitate the passage of a two-horse seed and manure drill between the rows. For established vineyards, where this is not possible, an old drill cut down to suit requirements should prove a profitable investment. The general practice is to sow 2bush. of field peas with 2cwts. of superphosphate to the acre. In heavy soils deficient in lime the use of 2cwts. or 3cwts. of gypsum can be recommended, or else ½cwt. of potassic manure. Generally, the use of gypsum is sufficient, as its action is to free the natural potash salts in such a soil and make them available to the plants. Much depends upon the time of sowing, and, generally speaking, this should be done before the autumn rains set in. This represents a period when there is not a great deal doing in the vineyards, and, in addition, the seed is in the ground ready to germinate as soon as the soil becomes moist enough. As a preparation, thorough scarifying is all that is necessary, owing to the fact that the soil should be in good order from the summer cultivation.

If good conditions prevail the crop should be ready to plough in by the end of July or early in August. It is generally recognised that the best time to plough the crop under is when the peas are in flower; but, if thought advisable, it may be better to anticipate this period to suit special circumstances. Time should be allowed for the green matter to rot before all the rain has gone; but, owing to the succulent nature of the mass, ploughing can be deferred until fairly late in most seasons. One of the first evidences of the beneficial effect to be derived from green manuring is the manner in which the vines retain their leaves, a fact which cannot fail to increase their vitality. For several years past peas have been sown on a portion of the College vineyard in a soil of a light limestone nature and under conditions decidedly unfavorable to vine-growing.

In spite of unsuitable conditions, the manner in which these vines retain their leaves when other portions of the vineyard are bare is a sure evidence of the benefit being derived by them from the organic matter. Although it is difficult to gauge results as to fruit-bearing under such conditions, it can safely be said that the cropping of these vines has improved since green-manuring was started.

One of the most consistent and convincing tests of green-manuring was carried out at Albury, New South Wales, by Mr. L. Frere. In addition, a series of experiments with other manures were carried out for a number of years, but results did not justify their continuation when set beside those of the green manure plots. At the outset, the growth of vines was weak, and yields had fallen as low as 100galls. to the acre. After some years of green-manuring, the growth of the vines became so strong that it was considered advisable to discontinue the experiment for the time being. In the meantime, the yields from these vines had risen from 100galls. to the acre until they reached from 400galls. to 500galls., and in one instance 600galls. per acre was reached.

It may be contended that the practice of green-manuring necessitates a delay in the ploughing under most conditions, but, even so, there will be little difficulty experienced in getting the crop to decay, which after all is the controlling factor.

Then, again, it is always possible to crop only alternate rows each year where large areas are being dealt with, thus rendering it possible to plough half of the vineyard early each year; in fact, this was the practice adopted in the vineyard at Albury, already referred to. So far, the green crop has only been referred to in connection with the increase of organic matter as a physical improvement to the soil, but it has a further action as the source of organic nitrogen. In this respect it has a twofold action, namely, the accumulation of atmospheric nitrogen on the one hand, and the decay and subsequent nitrification of the organic matter on the other. This nitrogen must undergo transformation into one or other of the mineral forms before it can be assimilated by plants.

In dealing with the addition of nitrogen to a vineyard, it must be borne in mind that in addition to the organic form referred to, there are other purely mineral forms of nitrogen, such as sulphate of ammonia and nitrate of soda, which are readily soluble in water and are in a form that can be absorbed by the plants. The effect of these two forms of nitrogen are characteristic and opposite. Organic matter on the one hand tends to the development of an excess of tannic acid in the wine, thereby materially increasing the keeping quality and prolonging the period of maturing. Mineral nitrogen in excess tends towards the opposite extreme, promoting an excess of albuminoids, which are a frequent source of danger to the resulting wine if not properly dealt with. In the well-balanced soil, tannin counteracts the albumen, causing its coagulation and precipitation.

Many vineyards benefit by dressings of purely mineral nitrogen, and for this purpose recourse must be had to either ammonium sulphate or sodium nitrate. In price they are both high and about the same, but the former will give the better equivalent of nitrogen. Owing to their expensive nature, it is possible to apply them in such costly dressings as to render their use unremunerative, owing to the value of the manure applied being in excess of requirements and beyond the value of any ordinary increase in crop. It is here that the need for experimental work is emphasized, because no hard and fast rule can be laid down for any one soil. As a general guide, it may be said that from 1cwt. to 2cwts. of either of these substances may be applied per acre. Its method of application is in the early spring, either by means of a drill or else placed in shallow furrows along the rows of vines. In addition to these forms of mineral nitrogen, there are various other forms of nitrogenous fertilisers to be obtained, such as dried blood and slaughterhouse refuse; also bonedust and bone super., which contain a fair percentage of nitrogen as well as their phosphatic properties. All these substances are valuable as fertilisers if they can be obtained in sufficiently large quantities and there is enough moisture to dissolve the vital elements from their composition.

PHOSPHORIC ACID.

South Australian vineyards, in common with the bulk of our agricultural lands, show a deficiency in this element of plant food. Its application may be said, then, to rank next in importance to nitrogen. So far as manuring is carried out at the present time in South Australian vineyards, superphosphate is, in many cases, the only form of fertiliser used. There can be no doubt, however, that where super. is giving good results at the present time the need of organic or mineral nitrogen will become apparent in the near future if consistent yields are to be obtained.

The vine uses less phosphoric acid in proportion to its growth and fruit production than do most plants, but nevertheless it is of vital importance to the general health and fruit development of the vine. Particularly does this apply at the latter end of the summer, when the plants are ripening off their wood and storing up in the pith a reserve supply of nourishment to feed the young growth in the early spring. The use of super. in connection with green-manuring has been dealt with, but whatever may be the claims of this practice, it must be remembered that in many cases phosphatic manures directly applied are giving excellent results.

There exists a considerable difference of opinion as to the best time to apply phosphates, but if we look into the matter carefully we find that it depends upon the type of soil and the amount of moisture available during the growing season. Being a slowly soluble manure, it is generally recognised that it should be applied in the winter months along with the first ploughing, and this would appear to be the most common practice. There are some growers, however, who prefer to drill in their super. during the summer months, while others, again, claim the best results from spring application. The first case suits the bulk of our vineyard areas. In the second, the result of the manure is not looked for until the following year, and the third is adapted to certain special cases, mainly light sandy lands in districts of good rainfall. The latter is the case on those light-colored sandy soils, such as are found in portions of the Barossa district. Upon these soils winter application of superphosphate gave no increase, as the manure was leached from the open loose soil by the winter rains ; in fact, it is said that one grower applied a heavy dressing of super. to a vineyard upon a slope during the winter, and in the spring found the greater part of it in his dam on a lower part of the property. With spring application on the same class of land yields have been increased fully 100 per cent.

It must be remembered that this class of soil is very poor in its natural state and incapable of producing heavy crops, but if by manuring the yields can be increased from one to two tons per acre, it is putting such lands to a very profitable use. There can be no doubt that the application of phosphates and the results achieved must depend on the type of soil and on the rainfall of any particular locality, and it is also certain that the greatest percentage increase will be observed upon lands of the type referred to.

As the opposite to the loose sandy soils there are the heavier types, containing a large proportion of clay, which retain the super. in spite of heavy winter rainfall, and, finally, there is the other extreme, represented by those areas of scant rainfall where no results are obtained from artificial manures, except under irrigation. If we take an average of the vine-growing districts, it will, in all probability, be found that the winter application gives best results.

In the heavier types of soil one of the main difficulties appears to be the placing of the phosphate deep enough to allow the vine roots readily to come in contact with it, owing to the fact that the phosphoric acid is persistently retained by clay lands in the upper layers of the soil. Thus it is possible to apply heavy dressings of superphosphate without any benefit accruing to the vines.

This question was investigated in connection with the Rothamstead plots, and an analysis showed that in soils which had been manured for 50 years with super., 83 per cent. of the unused residue of phosphoric acid was retained in the upper 9in. of the soil, while in the next 18in. no accumulation of phosphoric acid was noticed. It was further demonstrated that practically the whole of the phosphoric acid applied and not used by the crops could be recovered with a weak solution of citric acid from the top 9in. of the soil.

At the University of California the same question was investigated by Professor Loughridge in connection with the manuring of fruit trees. Soil of a stiff, clayey nature retained ·30 per cent. phosphoric acid in the first 6in., while the next 6in. had only ·05 per cent. Clay retained 1,000lbs. in the surface 3in., loam retained a similar amount in the top 6in., while sand allowed free percolation to the lower strata. The remedy then must be to place the super. as deep down in the plough furrows as it is possible. Probably the simplest plan is to open out a deep furrow in the centre of the rows, and by means of a simple distributing machine place the manure in the bottom. In the more open, gravelly or alluvial soils there is not the same necessity to apply so deeply, and here, no doubt, application with a drill before the second ploughing will give good results. The quantities for application will vary from 2cwts. to 4cwts. per acre.

POTASH.

Whereas we find nitrogen concentrated in the green portions of the vine, potash, on the other hand, is centred in the fruit, and is responsible for heavy cropping. In combination with the natural acidity of the fruit it forms acid potassium tartrate or cream of tartar. Large quantities of this substance are held in solution by the juice of the grapes, and during the processes of fermentation it is precipitated by the formation of alcohol deposits in the storage vessels as crude tartar ; in fact, so great is the quantity, that this commodity forms the base of the commercial supply of cream of tartar. In view of the amount of potash contained, it will readily be understood that a large supply of this subtance in an available form is necessary for prolific cropping.

It is a well-known fact that an analysis of most of the South Australian soils shows a percentage of potash equal to all general requirements of the vine, but it does not necessarily imply that this potash is in a form readily available as plant food. Possibly some corrective treatment may be necessary to bring about a conversion of the element from an insoluble to a soluble form. Particularly does this apply in the case of clay soils deficient in lime, where the potash is retained in the surface as carbonate and cannot penetrate to the roots in the lower layers. This retention of potash salts is an important factor in the fertility of the soil, whereas the corresponding salts of sodium, which are injurious to vegetation, are leached out by the rainfall.

Plants absorb potash more readily as carbonate than as sulph., and consequently deep-rooted ones, such as the vine, cannot obtain an adequate supply for their needs when it is locked up in the surface layers. Under these circumstances some corrective treatment is needed to release the carbonate of potash. This is usually done with gypsum. A double decomposition takes place between the pot. carb. and calcium sulph. Pot. sulph. is formed on the one hand and calcium carbonate on the other. As sulphate, the potash is washed down into the subsoil and comes in contact with the roots; but before it can be used another conversion into the carbonate must take place. First, a decomposition of the sulphate into the sulphide is brought about, and this in combination with water and carbonic acid reverts to the carbonate. In lighter soils, particularly of limestone formation, potash is deficient, and such soils will probably benefit by the application of any of the potassic manures available. Of these the sulphate and muriate are the most desirable forms.

Farmyard and all organic manures are fruitful sources of potash, but even where these are obtainable the necessity of some additional quantity of the element will be needed to balance the effect of the other nutrient elements. It must be borne in mind that an increased fruit production consequent on the use of potassic manures is weakening in its effect, and therefore the other elements of plant food—nitrogen and phosphoric acid—must be raised in sympathy in order to maintain the vigor of the vines.

LIME AND GYPSUM.

The amount of calcium needed by the plant is not excessive, and is generally covered by the natural percentage of lime in the South Australian soils. Even here, however, lime is in many cases needed, more particularly so in the heavy clay lands. Its effect is mainly physical, namely that of flocculating the clay particles, opening the soil to the passage of water, and tending to free other necessary elements of plant food which may be in an unavailable form. Heavy soil is made to work more freely if well limed, and in soils tending to be sour, owing to an excess of decaying vegetation, the alkalinity of the lime acts as a corrective, destroying the weak humic acids and preventing their accumulation. It is also essential to the life of the nitrifying bacteria, the work of which goes on much more rapidly where there is a good amount of lime in the soil.

Gypsum, or calcium sulphate, has much the same effect as ordinary lime, though it is probably not so caustic nor active in its effect. As a manure its value was over estimated, but its indirect action upon the soil fertility, especially as to the freeing of potash salts, renders it a valuable addition to a vineyard soil; thus it is important to the growth of those deep-rooted crops requiring potash, such as peas, &c., and therefore, in soils deficient in lime, it is the practice to use gypsum when growing peas as green manure. For this purpose ground gypsum may be used at the rate of 3cwts. to 5cwts. per acre. As a corrective to heavy clay soil it may be applied at the rate of 10cwts. to 20cwts., although for this purpose it is not so active as ordinary lime

Dealing with manures in general, we find that an acre of vines will absorb annually 50lbs. nitrogen, 45lbs. potash, and 10lbs. phosphoric acid. After all, manuring aims at the maintenance or the increase of the fertility of the soil, and if this is to be accomplished it becomes necessary to add annually these quantities of the various fertilising elements. As a commercial proposition the increase of the average yield of our vineyards should appeal to every grower, and there can be no doubt that if the matter is dealt with on its merits an appreciable improvement in returns will be found to follow the practice. Appended are some few results of experiments which are available

EXPERIMENT CARRIED OUT AT SEPPELTSFIELD.

Plot.	Manure.	1907-8. Cwts.	1908-9. Cwts.	1909-10. Cwts.	1910-11. Cwts.	1911-12. Cwts.	1912-13. Cwts.
2 & 5	Super.	4	4	4	2	2	2
	Dried blood	1	1	1	½	—	—
3 & 6	Super.	4	4	4	2	2	2
	Blood	1	1	1	½	—	—
	Sulph. pot.	1½	1½	1½	¾	¾	¾
1 & 4	Check plots	No manure					

Average Yield per Acre.

	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
2 & 5	1,383	5,196	4,863	5,628	5,388	5,208
3 & 6	1,323	5,367	5,481	6,546	6,042	5,292
1 & 4	1,014	4,878	4,824	5,217	4,782	4,620

Average Yield for Six Seasons.

	Lbs.	Increase. Lbs. per Acre.
1 & 4	4,222½	—
2 & 5	4,611	389
3 & 6	5,008½	786

In the first three years of this experiment the plots showed a loss, owing possibly to the dressings of manure being in excess of requirements. In the next three years a profit was shown on the outlay in manure.

EXPERIMENT CARRIED OUT AT RENMARK UNDER IRRIGATION.

Soil of a Heavy Loam Nature.

Plot.	Manure.	Cwts.	Value. s. d.	Yield. Cwts.	Increase. Cwts.	Profit. £ s. d.
A	Superphosphate	2	34 9	114¾	60	13 5 3
	Muriate potash	1				
	Nitrate soda	1				
B	Super.	2	34 9	117¾	63	14 0 3
	Sulph. potash	1				
	Nitrate soda	1				
C	No manure	—	—	53½	—	—
D	Super.	4	69 6	124	69¼	13 16 9
	Sulph. potash	2				
	Nitrate soda	2				
E	Super	2	20 9	86¾	32	6 19 3
	Nitrate soda	1				
F	Super.	2	21 9	96½	41¾	9 7 0
	Sulph. potash	1				
G	Super.	2	21 9	97½	42¾	9 12 9
	Muriate potash	1				
H	No manure	—	—	56	—	—

On Sandy Loam Land with a Similar Course of Manures.

Plot.	Increased Yield. Cwts.	Profit. £ s. d.
A	45½	9 12 9
B	41¼	8 11 6
C	—	—
D	37¼	5 16 9
E	30¼	6 11 9
F	33½	7 5 9
G	28¼	7 1 3
H	—	—

THE DISCUSSION.

Mr. H. S. Taylor (Renmark) asked the value of tick beans for green manuring. At Mildura the more progressive growers were using these. At Renmark gypsum was being added to the soil with very good results, and some of the stiff land that had previously been regarded as valueless had been brought into cultivation. Excellent results had followed the use of a mixture of 2cwts. of super. and 1cwt. of muriate of potash and sulphate of ammonia. Where poultry and pigs had been run on land planted with citrus trees extraordinary results had been secured. Poultry were also useful in getting rid of couch grass. Horse manure was reported to result in a coarseness of the product.

Mr. Laffer had not grown tick beans for turning in. The utility of the crop depended very largely on the district and the conditions under which they were working. He favored peas, as this crop gave a great bulk of green matter. If the tick bean were better suited to the river conditions, however, it was advisable to use them.

Mr. S. O. Smith (Angaston) congratulated the writer of the paper. He had found that there was a danger of souring the soil by ploughing in peas. At Renmark the practice now adopted was to chop them with a disc implement and allow them to dry, then plough them under. There was a certain amount of nitrogen in bonedust and bone super. He wished to know whether the small percentage warranted their paying £6 10s. for these when they could get super. for £4 per ton. There was no danger of super. leaching if it were applied early in the year. Lawes had discovered that practically the only constitutent that leached out of the soil was nitrogen. The early application of superphosphate to the vineyard or garden would be of benefit, because at that stage the soil was more likely to take in the constituents of the manure.

Mr. G. R. Laffer (Advisory Board) mentioned that the Board had circularised all Branches in the fruit-growing districts with a request that information should be supplied where available with respect to the manuring of fruit trees. He believed that a good deal of experimental work was being carried on in a small way, and this would be of considerable value if tabulated. Whilst very good work was being done at the Government orchard at Coromandel Valley, he thought that if they would take in hand an orchard 20 or 30 years of age, and tackle the problems that would arise in connection therewith, considerable good would be done.

Mr. A. Springbett (Lyndoch) asked whether the manures should be put well down in the soil, or on the surface. He had come to the conclusion that the vine had a set of roots near the surface and another going down well into the soil. When the vines were in bearing, and had a good crop of fruit showing, and a long spell of dry weather was experienced, the grapes withered. If a shower of rain fell, however, they would swell out to their proper size. Some of the growers at Angaston ploughed a deep furrow between the rows and the manure was put into this ; others drilled it in.

Mr. C. Morgan (Ironbank) asked whether stable manure was not too dry for use in the Mount Lofty Ranges.

Mr. Laffer said, in regard to the souring of land by ploughing in peas, this would depend largely on the type of soil on which they were working. In districts where the rainfall was not excessive, and on soil which during the summer months tended to become somewhat dry, there was little danger of this. If it did occur it was probably due to the insufficiency of lime. The amount of nitrogen in bonedust and bone super. would be available to the vines in districts where there was sufficient moisture to dissolve it, but generally the more active class of manures, such as super. on the one hand and one or other forms of the mineral nitrate on the other, would prove more profitable than either bonedust or bone super. Winter manuring in some of the very light sandy land showed no appreciable results on the crop, because the phosphoric acid was leached out. The early or late distribution of manure was a matter for experiment. Some favored summer manuring, as the return was not looked for until the following year. Others put it in when the first active growth was going on. This represented a time when there was a great deal of moisture in the soil and little chance of leaching. It was generally recognised that the thorough cultivation of the soil when the vines were being put in was of considerable value. When planting he favored placing a good supply of well-rotted stable manure in the bottoms of the holes, covering it with a layer of soil and putting the vine on top of this. Poultry manure was one of the richest organic manures, and there was no doubt that where it could be applied in conjunction with water it gave excellent results. The use of a complete manure was preferable to the use of a single manurial element. Under ordinary vineyard conditions manure which might be looked upon as the most valuable would not give the same results as they would under irrigation. Poultry running in the vineyard kept the soil loose, killed insects, and added manure to the soil. If they cultivated lightly they got a surface rooting, but with deep cultivating the roots went down deeply. The deeper they got the manure into the heavier soils the better. With the lighter soils it would wash down. Generally stable manure required a considerable amount of moisture to make it available. It acted as a mulch, restricted the effects of capillarity, and the evaporation of the moisture.

EVENING SESSION.

Mr. G. Jeffery, a member of the Advisory Board, presided over a large attendance of delegates and visitors.

WATER SUPPLIES.

Mr. L. Keith Ward, B.A., B.E. (Government Geologist), gave an address on "Water Supplies, with Special Reference to Underground Water."

Mr. Ward, whose remarks were illustrated by a number of fine lantern slides, said that a great deal of what he intended putting before the Congress was due to the researches of his assistant, Mr. Jack, who almost from the first day of his appointment had been engaged in inquiring into the question of the underground water supplies of South Australia. The publication of Mr. Jack's work on Eyre's Peninsula had led the Minister of Agriculture (Hon. T. Pascoe) to suggest that he (the speaker) should deliver an address on the subject before the Agricultural Bureau Congress. The matter had gone on to the Commissioner of Public Works (Sir Richard Butler), with the result that the delivery of the address had been arranged. He wanted first to give those present some idea of the work done by the Geological Department in the direction of assisting in the discovery of water—work which was done mainly for the benefit of the agriculturist. Afterwards he would say something in regard to the divining rod and its efficacy or non-efficacy.

RAINFALL.

The question of water supply was of course a very large one, many phases of which could only be briefly mentioned that night. Of the figures relating to the progress made during the past 25 years which had been placed before Congress during its sittings, he thought those which gave the rainfall over the agricultural areas were the most interesting. Those figures showed that the rainfall had dropped from 25in. in 1889 to a little over 14in. during last year. He took it that that decrease was not due to a decrease in the rainfall average, but was due to agricultural development having proceeded into the less watered parts.

Rainfall was the ultimate source of all useful supplies of water. There were seven artesian basins in the State, and in regard to the supply of water to those basins the first thing, of course, was the rainfall. Some people had tried to claim that a certain amount of water was provided to those artesian basins from the innermost parts of the earth ; but that was not the case, and it was the rainfall only, or practically the rainfall only, which supplied water to those basins. Hot springs near volcanic centres might be the outlets by which the deep-seated water of the earth's mass reached the surface, but those were not to be considered of any economic importance in that connection. In South Australia our water supplies were all concerned with rainfall, though in some cases (some of those artesian basins) supplies depended on rain that had fallen outside the limits of the State. In all other cases the rainfall over a district was directly related to the underground water supply of that district. They were very frequently asked why in some parts of the State they did not get the same underground supplies as in others. The first reason was that they did not have the same rainfall. The greatest rainfall in the State was in the Mount Lofty Ranges and the extreme South-East. The rainfall in the Mount Lofty Ranges was nearly 47in. per annum. Mr. Bromley (the Meteorological Officer for South Australia) had shown that the rainfall of the State was due to three important causes, viz., (1) proximity of the Southern Ocean, (2) the westerly winds which reached the south coast in the winter season, and (3) the mountain ranges which pushed the line of 10in. rainfall from Port Augusta to beyond Blinman. Mr. Bromley had also shown that in the settled areas of the State from 70 per cent. to 90 per cent. of the annual rainfall fell during the growing period—from April to October. One of the most useful things a farmer could do was to keep his own rain chart, and to keep it by months. It was most important to know exactly what was the distribution of the total annual rainfall for each district separately.

WHAT HAPPENS TO RAINFALL ?

The total annual rainfall, *i.e.*, the amount of water caught during a year in a rain gauge, was not the only thing that had to be taken into consideration, although it was the factor of greatest importance in matters concerning water supply. The destination of the water that fell as rain, or in other words, what happened to that rainfall, had to be considered. There were three things which might happen to rain. It might run off in a stream; but in South Australia there were exceedingly few running streams, and the run-off in that direction was practically negligible. Where, however, the rain did run off in streams it resulted in the ultimate return of the water to the ocean, or its accumulation in basins of internal drainage. Then part of the rain was evaporated, either directly or indirectly. Some of the rain was evaporated at once by hot, drying winds, and the many salt lakes in the interior were an evidence of the high amount of evaporation in the inland districts of the State. The third thing that might happen to the rain was that it might percolate into the ground. Percolation might be either visible or invisible. The percolation was obvious in the case of a light rainfall upon open-textured soils, so that there was no run-off.

UNDERGROUND WATER.

It was that part of the rain which sank into the ground with which our underground supplies were wholly concerned. There was a great deal of percolation which could not be seen, but which could be measured. If a stream running over porous soil was measured before it passed over that soil, and then after it had done so, there would be found a great diminution in its bulk of water. On the other hand a clay soil would not allow of percolation. Those present knew that clay was one of the best things with which to make a tight bottom for a dam, and that very tightness prevented the water from percolating. He had been asked to recommend the sinking of bores on hilltops covered with clay, but how could the water get down through dense clay ?

The water which found its way underground found storage in rock pores or crevices rather than in actual cavities, which only occurred in limestone country, such, for example, as was to be found in the South-East, where the limestone caverns might be seen at Mount Gambier in the walls of the great sinkhole in the centre of the town. In the great majority of cases, when they were dealing with underground water they were not dealing with open channels at all. The usual storage reservoirs were beds of sand or gravel, with little cementing material. In most of the artesian basins of South Australia the water-bearing layer was nearly loose sand. When the spaces between the sand grains became entirely filled up with mineral matter, a bed rock, which was impervious, was formed. In the case of any water that might occur in compact rocks (where mineral matter existed between the grains) they could only find the water stored in cracks or crevices. This was the case in the Mount Lofty Ranges, which were composed of slate. The quantity of water in the rocks depended on the number of cracks which existed to give storage room for it. This would be filled with water falling as rain up to the ground water table. Ground water was under no pressure. It was only in exceptional cases that a large supply of water was secured in the case of bores put down in such rocks. If there were a storage capacity provided by a fissured zone the supply might be reliable, but such cases were infrequent.

ARTESIAN WATER.

Artesian water was restricted to special areas in which several factors needed to exist together in order that useful supplies might be obtained. These conditions were—(*a*) adequate rainfall, (*b*) relatively porous rocks, so disposed as to admit the water and allow its passage ; (*c*) relatively impervious rocks, so disposed as to confine the water in the more porous beds ; (*d*) the tilting of the porous beds ; (*e*) the absence of any easy escape for water at lower levels than the ground surface at the site of the well or bore.

The common type of artesian basin was that known as the "one-sided," an example of this was the Adelaide Plains Basin. There was a tilting towards the sea which cause the water at the lower end of the slope to rise close to or to the surface. The Willochra Valley constituted what was known as a "valley basin." The supply depended on the place where the intake was, and upon the quantity of the water that passed underground by percolation. The reason they had a good supply there was that a quick run off was provided by Mount Brown and Mount Remarkable, and it reached the porous beds in a state of purity and was sucked up for utilisation at Bruce or Hammond.

SOUTH AUSTRALIAN ARTESIAN BASINS.

The artesian basins of South Australia were—(1) The Great Australian Basin, with a total area of 550,000 sq. miles, of which 112,000 sq. miles were in South Australia. The intake of this basin was principally in Eastern Australia, where the rainfall was good. The general movement of the water was towards west and south-west, except to the Gulf of Carpentaria. This basin was mostly artesian. The quality of the water was good, but in Queensland it was better than in New South Wales, and in the latter State it was better than in South Australia. (2) The Murray River Basin, of a total area of 106,000 sq. miles, of which about 27,000 sq. miles were in South Australia. The intake for the best waters of this basin was in county Lowan, Victoria, where there were 2,000,000 acres with a rainfall of 25in. and no run-off. The northern and western portions of the Murray River Basin were salt, and possibly the supplies from those portions came from a different source. It was mostly sub-artesian, except near Tintinara. (3) The Eucla Basin, with a total area of 76,000 sq. miles, of which 21,500 sq. miles were in South Australia. There was one flowing bore in Western Australia from this basin. The water was fit only for stock, but possibly the supply might be utilised in connection with the Transcontinental Railway. (4) The Adelaide Plains Basin, of about 1,000 sq. miles. The intake of this basin, to which he would refer later on, was along the foot of the Mount Lofty Ranges. (5) The Willochra Valley Basin, which was small but useful, and of which little was known in detail. (6) The Port Pirie Basin, which was salt in patches and, like the Adelaide Plains Basin, was artesian in places. (7) The Cowell Basin, which was sub-artesian, the main body of the water being salt.

The future of the underground waters of the eastern part of the continent was of very considerable importance. In Queensland, where the bores were put down in great numbers, several had ceased to flow, and it was necessary to pump supplies. They would perhaps have to wait for generations before the supplies were made up again. Victoria had put down a great number of bores in the Murray Basin, especially to the east of Pinnaroo and Bordertown. The source of the greater portion of the water was situated east of Naracoorte. The rainfall there was nearly 25in. in places, and it all went underground. Care should be taken not to drain this supply provided by Nature. The supplies in this basin were generally sub-artesian. At Tintinara one Government bore was just artesian, and there were a number south of this place where flowing supplies were obtained. Flowing bores were also to be seen on the Adelaide plains, viz., those situated at Paradise, Morphettville, Dry Creek, &c.

The exact depths at which water would be found at various points could not be definitely stated, but there was a well-defined basin passing along the coast and occupying about 1,000 sq. miles. The quality of the water was on the whole excellent, and only deteriorated in the vicinity of Port Wakefield.

In connection with the Cowell Basin a salt creek died out on the intake, with the result that the water was vitiated. But there were points at which it was possible to make use of the water, *i.e.*, where the fresh water rapidly flowed down the hills and was lost in the upper portions of the intake beds. The salt content in water taken from the ocean by the winds was distinctly measurable. The evaporation was exceedingly high, and the result was that salt was continuously being added to the soil. One other question which arose in regard to the Cowell Basin was why the same supply of water was not got on the western side of Spencer's Gulf as was obtainable, say, at Port Pirie? The answer was that Spencer's Gulf had been caused by a great fracture in the earth's crust, with the result that the geological features on the western side of Spencer's Gulf were quite different to those on the eastern side.

SALT CONTENT OF RAIN.

Another question of importance was the salt content of rain. The winds which swept up the moisture from the sea and sent it down on the land as rain also took up salt, and actual experiments in New Zealand had proved that every inch of rain that fell over an acre of ground distributed 4¾lbs. of salt.

The evaporation of the water meant, of course, the concentration of the salt in the water that remained. This question was of high importance in South Australia on account of the general lack of surface streams to convey back to the sea the salt introduced in the rain. Our great salt lakes were the ultimate repositories of much of the salt.

GROUND WATER.

Ground water was water which was not under pressure. Water lost below the surface by percolation sank down and saturated the permeable portion of the earth's crust which lies below the ground water level, or ground water table. This table was apparent when a well was sunk, for it was marked by the surface of the water. The position of the ground water level depended on (1) the porosity of the beds, (2) the annual rainfall and variations thereof with seasonal changes, and (3) topographic relief. The ground water table was much less irregular in any district than the surface beneath which it lies. That was to say, the ground water table was very much nearer the surface in a gully than on the top of a hill. It was important to remember that the ground water was always in motion, however slow that motion might be. The direction of the movement was usually the same as that of the surface drainage, for the reason that the ground water table conforms in a general way with the broader surface features. The movement of the ground water was thus down grade towards the lowest point of a district. He laid special emphasis on that point, because he had seen most extraordinary sites chosen for wells. In choosing a site for a well, especially in hilly country, the first thing to do was to get down into a gully. It was very important to get down as low as possible. It had to be remembered, however, that the general drainage features of every area must be considered carefully, and a well site must not be chosen at a point where other indications point to the probable existence of salt water. That was to say, low level sites must be avoided where underground circulation was very slow or absent.

TYPES OF WELLS.

The various types of wells were :—

(1) Wells in porous rocks in districts where rainfall is abundant, *e.g.*, between Naracoorte and Mount Gambier.

(2) Wells in areas characterised by very massive travertine limestone at the surface and by sheaoak vegetation, *e.g.*, Wurkagie-Witera, Polda, Terre, Oakdale (counties of Robinson and Musgrave).

(3) Wells in alluvial deposits—" soaks "—
  (*a*) Soaks at the foot of bare rocky slopes ;
  (*b*) Shallow soaks in creeks ;
  (*c*) Deep wells in main valleys.

(4) Wells in fissured rocks in the hills where there is a good rainfall, *e.g.*, in the Mount Lofty Ranges.
(5) Wells in porous strata bottoming on impervious rocks above the level of the main ground water table, *e.g.*, Condodringie (county of Robinson).
(6) Wells sunk to suspended water-tables, *e.g.*, Challner (county of Robinson).
(7) Wells obtaining fresh water from a top layer resting directly upon salt water, *e.g.*, Cameron's Courela (county of Robinson).
(8) Wells in sandhills—
  (*a*) Coastal wells in which the fresh water lies upon clay or upon salt water;
  (*b*) Inland wells in which the fresh water rests upon some impervious material.

FACTORS DETERMINING QUALITY AND QUANTITY OF WATER.

The factors which determined the quality of water obtained by wells sunk to tap the ground water were—(1) The amount and distribution of the rainfall; (2) the character of the rocks in which the water occurred and the soluble contents of those rocks; (3) the character of the soil on which the rain falls and its absorbent power; (4) the distribution of vegetation; and (5) freedom of contamination by sewage or by admixture with inferior water. The quantity of water obtained depended on—(1) The type of well; (2) the porosity of the water-bearing beds; and (3) the rate of supply of water to those beds. Ground water lay above artesian water in some parts of the State, and was separated from it by clay beds. If the clay seam was only a few feet below the surface the water was indirectly evaporated, but if the clay bed was a little deeper they had a good storage basin. Most of the creeks in the Gawler Ranges and Flinders Ranges were filled with gravel wash, and that was the place in which to sink a well. As regards the Gawler Ranges, the water was gradually flowing to the sea. There could be no question but that the underground water supplies would improve as clearing of the land went on.

CHOICE OF A SITE FOR A WELL.

What were the things which should guide them in choosing a site for a well? If they were seeking a supply from an artesian or sub-artesian basin, the matter was a very simple one. In the case of an artesian basin they must not get too high if they wanted a flowing supply, for the reason that they might get above the hydraulic grade. In the case of a sub-artesian basin the usual custom was to choose a site on a rise, whence the water might be distributed by gravitation. With regard to the choice of a site in the hills: In fissured rocks they should always choose gully sites, so that they might secure supplies from the convergent underground flows from both sides of the gully. It was impossible to hope for supplies if the surface was covered with impervious clay, such, for instance, as was to be found near Blackwood.

In regions such as Eyre's Peninsula it had been found that all useful supplies of water depended upon the existence of the following conditions:—(*a*) A gathering ground from which the rain water ran quickly to a place where conditions favored rapid percolation to a depth sufficient to prevent direct evaporation or the return of the moisture to the atmosphere by capillary action, and through the agency of the vegetation; or (*b*) a soil, such as sand, so readily absorbent as to enable the water to sink quickly to a depth below the influence of dissipating agencies and to come to rest upon an impervious layer, or upon the surface of the main body of ground water.

Timbering of Wells.

For the timbering of wells jarrah was the best, ti-tree came next, and then native pine, though the latter wood was distinctly inferior to the other two. Square wells of small sections were calculated to prevent the collapse of wall plates. Large wells were of no advantage where a windmill was used. It would be found of advantage to sink a well as small as was convenient, and if provision for storage was needed, this could be made by chambering out the lower sets near the water level.

Benefit of Clearing.

The clearing of native vegetation, such as the mallee, would be found to add materially to the available underground supply of water. The removal of absorbent surface soil, if it was underlaid by rock or clay which would give a better run-off, would improve the catchment. In Western Australia it was recognised that a couple of years after ringbarking soaks appeared.

Useful Waters.

Experience in South Australia had shown that the amount of dissolved salts in water that could be regarded as useful was greater than was generally believed to be tolerable. Animals that would unerringly select sources of drinking supply that were lowest in dissolved solids, and avoid those which were highest, would, if placed in regions possessing supplies of poorer quality, accustom themselves to a mineral content far greater than that in the poorer waters which they would not previously touch. This adaptability was in no country more remarkably shown than in Australia. The best waters contained less than 20 grains per gallon, whilst those containing 100 grains to the gallon were regarded as rather "mineral."

The ascertained limits of salt contents in useful water were as follows:—For domestic or potable water, up to ⅛oz. per gallon, although that containing up to 1oz. to the gallon had been used by settlers for considerable periods in times of necessity. Horses would work and keep their condition on water containing up to 1oz. per gallon. These animals would live on water containing up to 1¼ozs. per gallon. Cattle would live on that containing up to 1½ozs. and sheep 2½ozs. The presence of bitterness due to salts of magnesium would cause some reduction in the amount of total solids permissible. The methods of testing water for salinity were (*a*) with a salinometer, (*b*) by means of evaporating a measured gallon. It was inadvisable for the amateur to attempt the latter method.

TANKS.

The lecturer described in detail various methods of constructing tanks in different classes of soils. He mentioned that the water caught on iron roofs was equal to about ½gall. per inch of rain per square foot. Throughout South Australia the consumption was greatest during the summer, when the supplies from the rainfall were least. It was desirable that the tanks should have a capacity equal to 50 per cent. of the annual rainfall on the roof. The minimum storage should be sufficient to hold 30 per cent. of this rainfall. Care should be paid to the necessity for preventing concentration by evaporation, this being especially important in the case of waters containing appreciable amounts of dissolved solids. Where a new homestead was being planned it was advisable to select the well site first, and arrange the disposition of the outhouses and stables to prevent contamination of the supply. This applied equally to dams and tanks storing surface supplies.

In conclusion, the need for careful conservation of all supplies was pointed out. The reservoirs of ground water and artesian basins were alike far from being inexhaustible. The local sources, he said, would always be of greatest value.

THE DIVINING ROD.

He now wished to say a few words in regard to the divining rod as a means of locating underground supplies of water. The use of the divining rod dated back to the earliest historical times. In the early days it was used (1) to prove the site of old landmarks ; (2) to detect crime ; (3) to guide a traveller on a right course ; and (4) to indicate the presence of mineral lodes. While he would not personally place any faith at all in the claims of the dowser, he freely admitted that many people were honestly convinced that some ill-defined but special power was possessed by the diviner, and he also admitted that there were diviners who were honestly convinced of their own special gift. The geologist, to whom appeal was so frequently made after fruitless expenditure at sites recommended by diviners, might, perhaps, be pardoned for some measure of unbelief in the claims of dowsers. While successes undoubtedly did occur, there were many failures. The general public heard of all the successes, and the geologists heard of some of the failures.

The phenomena of water divining was variously ascribed to (*a*) magnetic or electric influences ; (*b*) changes of temperature and moisture on nervous organisations ; (*c*) radio-active emanations. But all such influences, if they existed, could be recognised and measured by delicate scientific apparatus in quantitative terms. It was important to remember that if the success of the water diviner was based on experience, local knowledge, and geological reasoning, the diviner, although useful to the public, was, so far as divining was concerned, a fraud.

It was a matter of common knowledge to geologists that the successes of diviners were most frequent in regions where few failures could possibly occur. There was abundant evidence of success, but what was that evidence worth when it was fully investigated ? Those successes occurred at sites selected by diviners in an area where water was universal, such, for instance, as on the north-west coast of Tasmania or the Adelaide Plains. He had even heard of a water diviner claiming payment for locating water in the Murray River artesian basin and also in the Adelaide Plains basin. Would a farmer think it remarkable that a man should discover an ear of wheat in a standing crop which would average no more than 9bush. to the acre ? And yet that amounted to the same as locating water in an artesian basin.

A possible explanation of the movement of the divining rod was that it was held in a restricted position which might cause, and probably did cause, unconscious muscular contraction, with the result of the deflection of the rod. It had been found by experiment that unconscious muscular movements happened most frequently at places where the operator's experience had led him to believe that water might be found. Diviners had failed conspicuously in limestone regions where water did flow in well-defined channels.

CONCLUSION.

While it was possible that the diviner might succeed where the geologist failed from unforeseen causes, it was nevertheless true that in the present state of our knowledge the advice of a geologist was preferable to that of a diviner.

It had been his object in his address to show that certain ascertained laws might be formulated from the known occurrences of underground supplies of water, and that all the wells of which they had knowledge in this State could be adequately understood by the proper application of recognised principles. The sections shown on the screen had been drawn with a view to giving those present an opportunity of forming a mental picture of the relation of geological structure to the occurrence of water, in the confident belief that, if the facts had been accurately classified, and if their correlation and sequence had been properly observed and recorded, the statements he had made would appear convincing. In other words, the endeavor had been made to show that all known occurrences of underground water could be explained by natural science without appeal to the supernatural. Human instinct was to appeal to the supernatural when phenomena that were not understood presented themselves. He hoped he had made it clear that the occurrences of underground water could be understood.

Before finally concluding, he desired to refer briefly to what had been termed pseudo-scientific water divining, which was based upon the deflection of a magnetic needle. It was perfectly useless, without a very detailed examination and study of the geological features in the area tested, to take the declination of a needle as a sign of water. A considerable amount of work had now been done in investigating the relation of geology to terrestrial magnetism, and it was admitted that the subject was exceedingly complicated. No detailed study had yet been undertaken in South Australia, and until such work was done no steadfast faith in the operation of an instrument said to detect water by means of the observation of magnetic declination could be justified. (Applause.)

An Interesting Question.

Mr. P. J. Edwards (Pinnaroo) expressed his appreciation of the fine address. He wondered whether the extensive drainage operations which were going on in the South-East would eventually affect the sub-artesian supplies in the Pinnaroo district.

Mr. Ward said that being drained away was ground water. The deeper system which supplied the artesian water would not be touched.

At the instance of Mr. Edwards (Pinnaroo), seconded by Mr. Koch (Lameroo), a hearty vote of thanks was accorded the speaker.

Thursday, September 11th.

Mr. G. R. Laffer (Chairman of the Advisory Board) presided over a large attendance.

BUREAU WORK.

In an address on "The Present Position and Prospective Work of the Agricultural Bureau," the Secretary to the Advisory Board (Mr. G. G. Nicholls) said the present position of the Bureau was strong numerically, and he wished to show that, in addition to a larger number of branches and members, there was an increased interest manifest in the organisation, as was evidenced by the number of members per Branch. In 1906 there was an average of 16 members in each Branch, in 1910 20 members, 1911 21 members, and in 1912 an average of 22 was reached. This was very satisfactory. The quality of the reports was improving steadily year by year. The standard reached was very high, and it was quite a difficult matter to know just how to reduce some of the lengthy papers, because they were so good. During the past year the following important subjects had been dealt with in papers, etc :—Fruit and vegetable cultivation, 57 ; wheat and general cultivation, 156 ; dairying and stock, 32 ; harvesters and harvesting machinery, 22 ;

horses, breeding, feeding, &c., 50; sheep on the farm, 46; hay and haymaking, 28; poultry, 22; pigs, 10; rabbit destruction, 14; fodders and grasses, 26; fencing, 10; afforestation, 10; in addition to a large number of other subjects with two or three papers on each. The Julia Branch had inaugurated a field trial, and this had been carried to a very successful issue. He desired to pay a tribute to the excellent work which had been accomplished by the hon. secretaries to the various Branches. The Bureau was greatly indebted to these men.

PRACTICAL WORK.

In 1896, in the long-settled northern districts the proportion of land fallowed to that under cultivation was 25·9 per cent. In 1911 the proportion of fallow had risen to 60 per cent. The Agricultural Bureau had had a great deal to do with this. The greatest memorial they could raise to the founders of this noble institution was the building up of the Bureau and the making effective of its work in future years. They should forget that they were members of Branches, and regard the Bureau as an institution—a concrete whole. The strength of the British Empire was largely due to the effectiveness of the units composing it, but much was due to the strong spirit of patriotism. The same applied to the Bureau. The possibilities of this institution were almost unbounded. They were now entering upon the second quarter of a century of its existence, and he was hopeful that a distinct forward movement would be made. There was a field of work at present hardly touched upon. He referred to the need for experiment. When systematically carried out these had a double value. In the first place they provided the only means of determining many of the practices that should prevail on many of the farms. Beyond that, however, was the greater benefit, that the experiments convinced the farmers as to the value or otherwise of a given practice. There were only about six Branches which conducted any experimental work, *i.e.*, which had done work which they deemed sufficiently important to report. There was, however, much experimental work done by individual members; but the fullest benefit of this was never realised, because it was never tabulated and recorded or brought under the notice of the farming community in general. There was scope for experimental work amongst fruitgrowers. They knew the questions which could with advantage be investigated. He would only mention manuring, systems of pruning, and cultivation under varying conditions. Irrigationists on the Murray swamps were practically unanimous that as a body they knew very little about working the swamps, and there was a tremendous field for experimental work there. Among the wheatgrowers he would only refer to the question of manures. In the case of one or two Branches experiments had shown that a few extra pounds of super. per acre above the amount generally put on in the district gave an enhanced return of several bushels to the acre. Professor Lowrie and Professor Perkins were continually telling the farmers that they were not putting sufficient super. on to the ground, that there was not enough to encourage a strong growth of feed in the stubbles, and that in many districts there was not as much phosphoric acid put on as was taken out by a good crop under normal conditions. If they did a little experimental work in the Branches they would be able to come prepared either to admit the truth of these assertions or to disprove them. The work that had been done in this direction by individual members was in many cases somewhat haphazard. No man could with certainty distinguish a difference of 1bush. per acre in a standing crop. If 1bush. per acre more could be won from the land it would mean thousands of pounds into the pockets of the farmers. The question was whether the Bureau should undertake any systematic experimental work, and if so, how it could be done. It would be an insult to farmers to suggest that there were only half a dozen men in the State who were capable of carrying out experiments successfully. There were some in almost every Branch of the Bureau. It was necessary that the Bureau should decide whether this was advisable, and then to proceed to arrange matters. If the results of the work were to be accepted without question there must be a small committee in each Branch to supervise, termed the "local experimental committee." This body should decide what experiments should be conducted. They should measure the plots on which the experiments were conducted, and satisfy themselves that the soil was fairly uniform in character. They should check weights of produce, &c., and all calculations made. One of the committeemen should be the keeper of the records. If they expected one man to do all the work they would have difficulty in getting volunteers. This would make a very attractive feature for the homestead meeting or visiting day. If the results were sent in to the Department to be published in the *Journal*, and afterwards to be summarised in the Annual Report of the Bureau, he ventured to say they would secure valuable data in this connection such as had not been previously collected in this State. To carry this into effect it might be wise to appoint a committee from such a meeting as this, consisting of representatives from the various districts. Failing this, the individual Branches could take the matter up, appoint a small committee, and go into the details.

Mr. W. H. Smith (Naracoorte) complimented the Secretary on his address. The position in regard to experiment was, however, that the busy time on the farm was just that when the experiments needed most attention. The farmer took more interest in and paid more attention to work on the Government farms. One way out of the difficulty was a higher scientific education in regard to agriculture. They had conducted experiments to determine the most suitable quantities of super. to use, the quantity of wheat to sow, and they had come to certain conclusions. He thought that if the Government would send the officers to meet the farmers and give practical demonstrations and advice, more good would be done.

Mr. A. Beviss (Strathalbyn) thought the suggestions of the Secretary in this regard should be carried out.

Mr. C. Ricks (Cherry Gardens), who went in for fruit and vegetable growing, gave an instance of the value of experiment on the farm. Fifteen or sixteen years ago he was told that oranges would not grow in Cherry Gardens. He put in trees, however, and at present had three acres of oranges which were doing very well.

Mr. F. Masters (Roberts and Verran) favored the idea of the Branches conducting experiments, because they were more acquainted with the local conditions. He moved, "That this Congress recommends that more experimental work should be conducted by the Branches." This resolution could, if carried, be passed on to the Branches.

Mr. R. Johnston (Roberts and Verran) seconded the motion.

Mr. D. Carmen (Pine Forest) supported the motion. He was quite satisfied that there was a great deal for agriculturists to learn, and the farmers were in a position to conduct experiments to the advantage of the farming community.

Mr. S. Giles (Mount Remarkable) said the Government was doing valuable work in this connection ; but the value of the experiments was not brought home unless they were verified by the farmers themselves. The Government lead the way, and the agriculturists should adopt their advice to meet their individual requirements.

The motion, "That this Congress recommends that more experimental work should be done by Branches," was put to the vote and carried unanimously.

Mr. J. R. Coles (Longwood) moved "That the Branches be divided into groups, and that each group be advised to conduct experimental work along certain recommended lines simultaneously, and that the Branches constituting the several groups should communicate direct with one another in connection with the work." By this means, he thought, a great deal of useful information would be disseminated.

Mr. C. Ricks (Cherry Gardens) seconded.

Mr. G. G. Nicholls moved "That a committee be appointed from those present, to consist of two representatives from Eyre's Peninsula, two from districts north of the Burra, two from the district south of the Burra to Adelaide, two from the Pinnaroo district, two from the South-East, two from the Hills, and two representing the Irrigation Areas ; this body to draw up a plan of experiments to be recommended to the Branches in the respective districts during the present year."

Professor Perkins said the difficulty was that a body of men representing different districts were going to commit individual districts to a certain policy. He thought the Congress could adopt the view that this work would be advantageous, but the fixing of the practical work should be determined at the next Conference of Branches in the respective districts. He was afraid the body suggested was not the best to settle the character of the work to be done.

Mr. R. Carter (Canowie Belt) agreed with Professor Perkins.

Mr. Nicholls explained that the proposal was for the central committee to suggest only, and that discussion could still be provided for at country Conferences if necessary. The motion was carried, and a committee consisting of the following gentlemen was appointed :—Northern Districts—W. Gum, Amyton ; S. Eyre, Georgetown. Lower North—J. P. Pontifex, Paskeville ; E. H. Gray, Riverton. Hills and Fruitgrowing—C. Ricks, Cherry Gardens ; S. O. Smith, Angaston. Irrigation Areas—H. S. Taylor, Renmark ; T. G. Rogers, Waikerie. District East of Murray—W. B. Russell, Loxton ; A. J. H. Koch, Lameroo. South and South-East—S. H. Schinckel, Naracoorte ; C. P. Hodge, Tintinara. Eyre's Peninsula—T. Masters, Roberts and Verran ; E. M. Page, Green Patch.

The Committee met at a later hour and drew up suggestions for consideration by the Branches, and arranged to have same sent out at an early date.

CONFERENCE OF HILLS BRANCHES.

The Annual Conference of the Hills Branches of the Agricultural Bureau was held at Mount Barker on the 13th instant. In addition to the Hon. T. Pascoe, M.L.C. (Minister of Agriculture), the following officers represented the department :—The Director of Agriculture (Mr. W. Lowrie, M.A., B.Sc.), the Horticultural Instructor (Mr. Geo. Quinn), Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), G. R. Laffer (Chairman), and G. G. Nicholls (Secretary Advisory Board of Agriculture). The chair was occupied by the President of the local Branch, Mr. H. N. Bell, and the undermentioned delegates attended :—Strathalbyn—A. Beviss, P. A. Cockburn ; Morphett Vale—E. E. Hunt, F. Rosenburg, L. F. Christie, A. C. Pocock, H. V. Sprigg ; Blackwood—A. A. Magarey, A. W. Magarey, H. E. Sibley, C. G. Savage, W. L. Summers ; Meadows—W. Phillips, G. E. Ellis,

G. T. Griggs, Pearson; Woodside—A. S. Hughes, G. J. Sampson, F. Baldock; Cherry Gardens—G. Jacobs, C. Ricks, G. Hicks, J. Lewis, A. Broadbent, H. Jacobs, S. W. Chapman; Mount Pleasant—H. A. Giles, D. C. Maxwell; Clarendon—E. Dunmill, T. B. Brooks, A. Phelps, J. Piggott; Uraidla and Summertown—T. H. Collins, E. Hawke, W. Squires, H. F. Johnson; Longwood—W. Nicholls, E. J. Oinn, E. A. Colbey, E. A. Glyde, A. F. Furniss, W. H. Hughes; Ironbank—J. T. Morgan, W. H. R. Coates; Port Elliot—H. B. Welch; Gumeracha—J. Monfries; Narrung—W. L. Williams; Mount Barker—A. Watson, H. Coppins, H. Jones, J. A. Ferguson, L. S. Hughes, J. Bunnett, B. Bunnett, P. Stephenson, F. Simper, J. C. Gallasch, W. Pearson, C. B. Pope, R. C. Hollamby, J. Morris, B. Fuller, W. G. Wilks, W. E. Daddow, F. R. Follett, J. Pope, H. A. Monks, J. Cleggett, B. Stephenson, B. H. Fiedler, J. E. Smith, W. E. Davis, J. Coventry, F. Adams, A. D. Wilkinson, D. L. G. Monfries, H. N. Bell, C. Miels, W. Stephenson, J. F. Moore, L. A. Cockshell, A. B. Blades, L. Cornish, E. P. Mappley, E. Schmidke, G. Milne, J. Frame, C. Liebelt, P. F. Liebelt, J. F. Liebelt, H. Pope, Dr. Scott.

OPENING ADDRESS.

The Minister of Agriculture said he had opened, he believed, more Conferences of the Agricultural Bureau during the last two years than any previous Minister had ever dreamt of opening. He had been from one end of the State to the other in pursuance of that duty, and had found great pleasure in the performance of it. Every conference had represented a vastly different class of country in the matter of soil, climate, and rainfall; hence the difficulty of laying down hard and fast rules for the guidance of the primary producers in all. Compared with many other parts of the State, the people in the hills had much to be thankful for. For example, on his own farm near Terowie this year the rainfall had not totalled 5in. They would easily recognise the impossibility of growing under such conditions crops of the character that could be successfully raised in the hills. Coming up from the city by motor car that morning, he had been much impressed with the obvious fertility of the soil, and the general atmosphere of prosperity, and could not help making a comparison with the North, as he saw it a fortnight ago. It seemed as though he had been transferred to a country altogether different. The opportunities for successful production of various kinds in the hills were better probably than anywhere else in the State. There was always a certainty of some return. He had no doubt that as a result of the adoption of the most scientific methods of cultivation the carrying capacity of the land would be materially improved, and the population would increase many times over. In the Far North the men on the land were dependent very largely upon one crop—wheat. In the Lower North—probably the best wheat-growing area in the State—there were greater possibilities in respect to other crops, but not nearly such excellent possibilities as they had in the hills.

Profitable Industries.

Apparently, if there were one thing likely to prove a profitable occupation in South Australia, owing to the needs of other parts of the world, it was the production of special fodder crops for the purposes of stock-raising. Consumption in the older countries was rapidly outstripping the supplies, especially of meat. Higher prices were inevitable, and promised for local stockowners a better opportunity of reaping benefit than they had ever before enjoyed. Without doubt, it would pay the farmers to give increased attention to growing fodder crops and marketing them on the hoof. His observations in regard to meat applied also to cheese, butter, and other dairy produce. The keeping of stock and the proper feeding of them would not only yield a direct return, but would assist to enhance the fertility of the soil. Messrs. Pope Brothers had provided a splendid illustration of the possibilities of soil improvement, for, by judicious treatment and well directed enterprise, they had converted a seeming waste into a very fertile area, which gave promise of enormous crops in the future. So far as fruit culture was concerned the hills had a tremendous advantage over the irrigation settlements on the Murray, where the growers were handicapped by big expenses, including the payment of about 30s. an acre per annum for water. In the hills they had sufficient natural precipitation, with efficient cultivation, to grow good crops with almost absolute certainty. Some people asserted that the limit of profitable production had been reached in the case of apples, but Tasmania, which was the largest grower in the Commonwealth, was still steadily extending the areas under trees. That did not suggest any fear regarding over-production. Personally, he was convinced that there was an important future before the State, not only in the matter of meat and dairy products, but also in connection with fruit, especially as the facilities for transportation were increased, and the difficulties in the way of proper temperature, &c., on ship board were overcome. He believed that the producers in the hills were fully alive to the privileges which they enjoyed, and that they would do even more than they had done in the past to bring the name of South Australia to the fore. In conclusion, he emphasized the value of such gatherings as that, and contended that while they were continued the men who attended them would never get behind, but would ever improve in their methods, augment their output, and increase their prosperity. He wished the Conference and the primary producers generally every success.

Thanks.

At the instance of Mr. J. Pope, the Minister was accorded a hearty vote of thanks

LIVESTOCK AND SOIL FERTILITY.

In introducing a paper on this subject Mr. H. V. Sprigg, of the Morphett Vale Branch, said the dearly-bought experience of American farmers on virgin soil showed that the continuous growth of cereals tended to exhaust the fertility. It behoved farmers in this State to profit by this, rather than wait until they were taught the bitter fact. The paper read—"The true principle of good farming is to get as large a return from the land as possible, at the same time maintaining, if not increasing, the fertility of the soil. If all the crops grown on the farm are carted to market and sold the farmer is selling the fertility of his farm, and such a system must end in depletion. To maintain its fertility he must turn his farm into a factory and change the raw products into milk or meat, the by-products being returned to the land as manure. Animals are a very important factor in soil making, and the farm that is well stocked has soil makers continually at work maintaining its fertility. Rotation of crops and live stock systematically worked are absolutely essential. Farming cannot be carried on successfully by drawing on the capital any more than any other business, and because the capital is represented by the fertility of the soil, that it has taken ages to accumulate, is no excuse for squandering it in a lifetime—you cannot eat your hen and go on selling her eggs. The factors underlying soil fertility are very complex, much is known, but probably more is unknown. To determine the amount of plant food by analysis does not help much, even poor soil has enough potential plant food to grow hundreds of crops ; it is only immediately available plant food that counts, and that cannot be determined by analysis, as it depends on the synchronising of so many conditions, such as tilth, moisture, climate, humus, lime, bacteria, and many others. The farmer cannot go on increasing his yields by simply putting the required plant food into the soil in the shape of fertilisers any more than he can increase his butter-fat yield by feeding his cow on machine oil. He must let nature work in her own method, and all he can do is to provide her with favorable conditions, as far as he knows them, and is able. Both experience and experiment have shown that certain factors that he can control or provide are imperative in addition to plant food ; the most important are a good tilth, humus and lime. These, with the requisite moisture, allow a free circulation of air, and provide conditions required for the development of bacteria, which are important agents in rendering plant food available. Other practices are injurious : for instance, to continually grow the same kind of crop, sell the grain, and burn the stubbles will spell diminishing yields, and even with fallow and fertilisers must ultimately burn up the humus and consequently the nitrogen. The soil will also become intractable, full of weeds, difficult to work, and a physical condition inimical to fertility will ultimately arise. Whatever the reasons may be, 'land that has become 'sick' to the same crop will respond to another kind, so, to obtain the best results, rotation of crops must be adopted. The essential factors in any rotation are deep and shallow rooting plants alternately and the inclusion of a legume. Different root systems feed in different layers of the soil; also the decaying root and leaves of the one are excellent food for the other, and the legume insures the nitrogen supply. Rotation is also the best method for preventing disease and insect pests. All pests, whether parasitical or insect, are specialised feeders, and by increasing the interval between the host crop it is rendered difficult, if not impossible, for them to exist. As an instance, 'takeall' can be cured by the adoption of a system of rotation. As a natural corollary one of the greatest advantages derived from a rotation of crops is that it renders possible the keeping of live stock as a means of secondary production of meat and milk, the best paying products of the farm, returning the by-products to the land in the form of manure. The great bulk of plant material is drawn from the air, only about 3 per cent. of the mineral matter being taken from the soil, and, of course, the water—about 72 per cent.—the remaining 25 per cent. being derived wholly from the atmosphere in the form of carbon. If, as in green manuring, the whole of the plant is returned to the soil, it will follow that the soil will be the gainer by just so much material as was drawn from the air. When, however, it is fed to farm animals it is found that 50 per cent. of the dry matter reappears as manure, the rest being used up in animal functions and tissue. If the crop is fed off, say, by sheep, the farmer will save this 50 per cent., less the small portion of ammonia lost by evaporation. When stored in manure heaps the loss may amount to anything from 20 per cent. to 50 per cent., according to the method of storage, treatment, and use. There are other aspects of this question it will pay to consider. Australia is one of the most favored countries in the world for live stock production, and this particular district is not the worst of it. The mild climate means that less food is consumed in producing heat, that stock is healthy, matures quickly, and there is not the cost of winter stabling, the stock running and getting their own living, as it were, all the year round. These advantages are so little valued as special, that many refuse not only to grow any fodder crops, but also to conserve any of their waste products, such as straw and chaff, so that when they have an adverse season their stock is starving, as it is in many places to-day. An instance of the favorable conditions for stock in Australia is the command of the wool market of the world; and when it is realised that, with the exception of South America and perhaps South Africa, in the other countries the live stock, if not decreasing, is not increasing at the same ratio as the population, and most of them do not produce enough for their own consumption, Australia's importance in the meat market of the world may be seen. Distance is now measured not by miles but by time, and by utilising cold storage this State can put its meat on the European market in perfect condition in a few weeks. My object in writing this paper is not simply to make quasi-scientific statements of the principles of agriculture and fertility, and of facts that may seem platitudes, but to emphasize the fact that live stock and meat production are not given the important position on most farms that they deserve. A few sheep are kept as scavengers, with a few cows and pigs as side lines, but they should have the primary position. The bulk of the farm produce should walk to market, the residue being returned to the land. This does not mean giving up cultivation and tillage and turning stock into the paddocks, sitting on the fence watching them starve, and then dosing them for dry bible. It means more and more varied cultivation, more intense farming, with seeding spread over a longer period. Some will say they cannot grow feeding crops, and that the summers are too dry to grow summer feed without irrigation. Nature has, however, answered this, unfortunately for many of us, by the luxuriant growth of stinkwort and other noxious weeds with which fallows and grazing lands are covered during the summer. What are to be grown is another question. Among legumes the value of peas as a forage crop for fattening freezers is undoubted ; and lucerne in many places is successfully grown ; also rape and mustard and thousand-headed kale. Mangolds and beets among the root crops should be tried. With the barley crop lucerne and clover may be sown with good results. On this question of what to sow hangs the main object of this paper. I want to throw out a suggestion and make an appeal to this Conference and to all the Branches of the Agricultural Bureau. What I suggest is that each Branch make experiments and trials with fodder crops under field conditions by its members, with the object of finding the most suitable rotation for its district to increase the stock carrying capacity of the farm. By co-operating in this manner, different members trying different crops, a lot of valuable information can be obtained in a short time which it might take an individual a lifetime to acquire, and each district would work out its own salvation ; if successful the benefit would be inestimable. I referred previously to the luxuriant growth of stinkwort and other weeds as proof of the capacity of our soil and climate to sustain summer growth without irrigation. Here may be a field for research, and if any kindred plants are edible for stock, by proceeding on the lines of Mendelism and Luther Burbank an exceeding valuable fodder plant might be discovered. The particular rotation or live stock best to use I have not attempted to say. This depends on the district, the farm, and the man. What I want to emphasize is the underlying principle that rotation of crops and live stock will increase the profits and the fertility of the farm."

Mr. Giles (Mount Pleasant) recommended all growers of lucerne to cut and carry off the crop. If they fed it off the crowns would be eaten. Every three years or so it should be given a scarifying and top dressing and it would last for a very long time.

Good discussion followed, in which the opinion was freely expressed that the production of live stock demanded attention in the hills districts.

SOME SEASONABLE POINTS IN THE CARE OF THE ORCHARD.

Mr. Geo. Quinn (Horticultural Instructor) delivered an address, in which he said—"Although the occupier of a fruit garden can never find an excuse for being idle, some periods of the year find him more busily engaged than others. The advent of spring, when all nature starts into renewed activity, is one of these busy periods. In addressing myself to this subject, I propose to deal with one or two phases of orchard work that are at present exercising the minds and muscles of fruitgrowers. The return of the sunshine in increasing strength not only causes weeds and grass to spring with almost magical rapidity into flower and seed, but it increases evaporation vastly and threatens to leave the ground baked and dry. The portion of the land which, during the winter, has been besodden with moisture soon becomes the hardest and driest part of the orchard. The realisation of this fact leads one to inquire why these opposite conditions in the physical composition of the soil so quickly follow upon each other with the change of the season, and how can these extremes be corrected. The reason our orchard lands in these ranges where the rainfall exceeds, say, 27in. per annum become sodden in winter is that they are mostly underlaid by close-grained clays which do not readily permit the rain to pass through their strata, and consequently its principal methods of escape are by flowing off at the surface or evaporating therefrom. It is possible these remarks have not a fitting application in the present season, but they will apply to the average year's experiences. When land becomes waterlogged the roots of the trees stand through the winter in an area which has become devoid of oxygen, and the result is they perish or to a great degree lose their power of resistance and fall an easy prey to bacterial and fungoid agencies which are always on hand waiting to decompose their tissues back to the original elements. The fruit tree thus affected does not usually display any evidence of the injury until the return of spring or early summer, when, having started, its buds soon use up the accumulated nutriment stored from the previous season, and after the first effort at leaf and blossom its vitality is stayed. In advanced cases it simply dies, or in others less complete progress in leaf and shoot formation waits upon a fresh root growth from those portions of the root system—usually near the surface—which have survived. The obvious remedy is to prevent that over-saturated condition arising at any rate in the main rooting area of the trees. The only feasible method whereby this can be attained is by under-draining the area so affected. It does not follow that the whole of an orchard area needs under-draining, neither should we cling to the fallacy that because the surface is sloping that it is necessarily exempt from over-saturation. As far as my observations go the springs are largely found on the hillsides, showing clearly that the surface strata is not continued down in parallel layers. The suggestion I have to offer is that in the orchard wherever water oozes from the slopes those spots should be carefully marked and drains laid in during the summer or autumn season whenever time permits. The effect of this want of a free passage for the winter's rain through the soil is not by any means necessarily seen upon orchard trees during the first few years after planting them. On the contrary, the evil effects appear to accumulate with the reaching out of the roots for a greater feeding area, and the increasing demands for nutriment made by the enlarging tree as it bears its crop of fruit. Of the various kinds of underdrains none are so truly effective as those formed of burnt clay pipes laid end to end on an even fall. These are now procurable in the State at about 63s. per 1,000ft. for 2in. diameters, which is large enough for most purposes. This means about five chains of drain pipes for £1. The cost of making the trenches and laying them in position will depend on the nature of the land for trenching and the depth they are inserted. This, in most soils, will be not less than 2ft. 6in. The collecting drains should not be carried anything like straight down the slope, but rather take an oblique course so as to intercept the percolation of a wider area. To use a homely illustration, they should " fishbone " between the rows of trees into the outlet or main drain. Probably the most important consideration in pipe draining is to make the bottom of the trench where they rest butted end to end with a perfectly even fall, as any undulations must inevitably result in the silting up of the pipes. There appears to be some misapprehension in the minds of those who have not used drain pipes, respecting how the water enters the drain. When we are assured that the drains only start to operate as the soil water rises from beneath and enters through the joints, we can realise that the soil is kept oxygenated to the full depth the drains have been inserted ; hence the deeper the drains the deeper the soil is sweetened and kept suitable for root extension. Land that is trenched or subsoiled will gradually consolidate, but a properly drained area retains its wholesomeness as long as the drains remain operative, as each winter's moistening swells the soil plots between the drains, and each succeeding summer's drying out shrinks it again. This aerating action breaks down the particles, making a larger and more continuous area of inter-granular spaces, somewhat erroneously called capillary spaces. It is in these interstices the sweet or wholesome soil moisture is held and moves, and hence it is that the drained soil is not only drier in winter than non-drained land, but it is also moister in summer. This is not a mere platitude, as the former can be tested by driving a team over the land, and the latter by the simple process of digging a hole into the subsoil and examining it for moisture. Although well-drained soils hold their capillary moisture longer into the summer than those not thus treated, the best results cannot be expected without the surface of the land be treated to suitable tillage. On the open country less favored with a good rainfall than these districts the necessity for getting the surplus moisture away from the trees in winter is almost entirely absent; in fact, on the contrary, there the land is opened up as early in winter as possible to admit the rain evenly to the sublayers from whence, by certain forms of summer tillage, its escape is retarded. The steeper character of the orchard land in the hills renders it liable to " wash " or " slide " if treated in this manner, and the average hillside orchard with a good rainfall is, doubtless, best left in grass and sod until the bulk of the winter's rain has fallen. There appears, however, much danger that the erstwhile sodden land may, with the quick return of summer, become so rapidly baked on the surface that the tillage operations are difficult to perform in a satisfactory manner. There is very little doubt that fruit trees in the hills suffer much more from the effects of a protracted spell of dry weather than do those of the plains, which are apparently more inured to harder fare. In consequence of this danger, there is much to support the opinion that whilst orchards in the hills do not need winter tillage they require good attention in this respect in the spring and summer, more particularly when the winter's rainfall is below the average and the summer proves dry. It is pertinent to ask what is good tillage in spring and summer? I hold the opinion that this is best answered by a good ploughing or digging of moderate depth, followed immediately by a pulverising implement such as is found in the various forms of cultivators. The ploughing is to bury the weeds and aerate the surface and make possible the subsequent scarifyings which break the furrows down to as fine a state of subdivision as possible, and to spread it evenly and flatly like a dry blanket to prevent the moisture from the sublayers finding a direct contact with the atmosphere. Whenever enough rain falls to consolidate this surface through to the unpulverised soil below, the surface should again be stirred to break that contact. May I suggest a modification of this summer practice along the lines of what is expected from the trees. If they are quite young and strong growth is desired the summer tillings may, with advantage, be persisted in through to the autumn whenever needed. On the other hand, if the trees are mature in stature and inclined to too great vigor as opposed to fruit setting, after mid-summer it may be wise to scarify somewhat tardily with a view to permitting the escape of moisture and thus ensure an earlier ripening of the wood and leaf growths. Again, if the trees are carrying heavy crops their demands upon the soil moisture are greater and tillage should be persisted in to secure the best sample of fruit. Sometimes, when the possibility of ploughing has become dependent upon a soaking rain—perhaps late in the spring—and the soil is likely to bake quickly in the overturned sod, it is found desirable not to delay the pulverising until the whole area is ploughed. I have seen excellent work done by running ordinary harrows every few hours across the land which has been ploughed, so as to prevent crusting and subsequent lumpiness, which means an ineffective mulch unless a heavy roller be used prior to scarifying. Whilst upon the tillage of the land largely depends the possibility of keeping the trees in health and the production of a profitable yield, these operations may, unfortunately, be nearly all wasted if the various animal and vegetable enemies of the tree and its fruit are not controlled. With the return of the leaf, the blossom, and the fruit, awaken into activity those foes of the orchardist. The codlin moth caterpillar, which has lain dormant in its snug cocoon, has felt the quickening touch of the sun's warmth and changed into the pupal or chrysalis stage, and as the young fruits on the pear and apple begin to be seen amongst the foliage the moth breaks its way out of the pupa case and cocoon and emerges into the light of day to fulfil its functions of reproduction. With the eye of faith, founded on accurate observation, the fruitgrower sees this insidious foe, guided by instinct, depositing its eggs close to where its young, when emerging weak and tender from the egg, can find, without assistance, the means of sustenance which is afforded by the fruit. This insect, which is a native of Europe, doubtless ravaged the apple orchards of those old lands from the time when the apple became an edible fruit ; but with the exception of catching a few odd, fully fed-up caterpillars which had done all the damage they could in their generation, no genuine attempt was made to control this pest until in the new land of America someone connected up the life history of the insect and found its vulnerable stage and formulated a remedy thereon. The psychological moment in the fight against this pest opens with the setting of the fruits upon the apple and pear trees, but it only ends with the harvesting of the crop. Modern science and practice has assured good results when these newly formed fruits are sprayed with an effective poison, such as arsenate of lead, and two or more sprayings follow along upon this early application, the best results accruing in the case of late ripening varieties when the latest spraying is given towards the end of January or early in February. Many growers now abandon the use of the bandage trap and the cleaning of the stems of the trees ; but, although somewhat troublesome, it is questionable whether this is wise. The bands afford a good index to the value or effectiveness of the spraying, and the stray caterpillars which avoid being poisoned should not be afforded a safe refuge about the stems or bark of the trees.

Fusicladiums and Shothole Fungi.

Among fungus pests which exercise the minds of fruitgrowers in these hills the most prominent are the fusicladiums, or " black spots," of the apple and pear and the shothole fungi of the plum and cherry. The former, it has been demonstrated, are most vulnerable in the spring with the bursting of the buds and the setting of the fruits, and it is at this spring season that an effective coating of fungicide, such as Bordeaux mixture, has the greatest preventive action, for up till now it is a question of annual prevention and not cure upon which we can rely only." The making of Bordeaux mixture, he considered, was an important factor. Arsenate of lead was procurable from chemists, but Bordeaux mixture required to be manufactured by the orchardists. With the usual method adopted in making this mixture there was generally an excess of lime. This was very often the direct cause of injuring the foliage and the fruit. Pickering thought that this should not be used, and he contended that by using lime water only they did not get this surplus coating of lime, which interfered with the action of the carbon dioxide on the copper compound which was the actual fungicide in the mixture. With regard to application, he felt certain that the value of the mixture did not depend on the strength that they used, but rather on the time at which it was used. It had been shown by laboratory tests that a fungicide much weaker and consequently cheaper than that generally used would destroy the germinating spore of the fusicladium. He strongly urged them to use it at the bursting of the flowers, and again at the setting of the fruit. Shot-hole was not controlled in the same way as they controlled the curl leaf of the peach. By using Bordeaux mixture in the autumn they could check injury to the plum, apricot, and cherry. It was prevalent at the present time in the young shoots, which appeared to have died under the influence of fire. The attack began before the bud began to emerge from its winter covering.

QUESTIONS.

Mr. H. Jones (Mount Barker) asked whether it was possible to prevent attacks of curl leaf by spraying.

Mr. Quinn replied that this could be prevented in this way. Curl leaf was probably the simplest of all the fungi to control. They had carried out very exhaustive tests at Blackwood for three years, going to the trouble of picking the affected leaves from the trees. Best results were obtained from the use of 1¾lbs. of washing soda and 1lb. of bluestone, dissolved separately and mixed with 10galls. of water.

Mr. E. T. Grigg (Meadows) asked if the Bordeaux mixture could be used for black spot at the same time that they were using arsenate of lead.

Mr. Quinn said arsenate of lead and Bordeaux mixture might be put on with the one operation if they were compounded separately. The Bordeaux mixture could be used by itself when the flowers were bursting, combined with the arsenate of lead when the fruit had set, and used a third time, by itself, if there were a likelihood of the spots appearing. It was a question of having a thin film of copper upon the fruit.

Mr. W. Pearson (Mount Barker) asked if there was any known remedy for black spot in the walnut.

Mr. Quinn said that although this disease outwardly resembled the black spot of the apple and pear, it was due to a bacterium and not to a fungus. A bacterial disease operated in the sap, and up till the present no good had resulted from any spray or outward application to a bacterial disease. They should begin by growing the trees from clean stock. The best plan was to rigidly rake up and burn all the diseased fruit and cut away the damaged points of the shoots and burn them.

Mr. B. Stephenson (Mount Barker) desired to know the best time at which to spray peach trees badly affected with aphis, and would the spray destroy the bees ?

Mr. Quinn replied that effect on the bees depended on the spray that was used. Bees were not affected by the contact spray used for aphis ; they were destroyed by poison. If they sprayed with poison when the trees were in full bloom they might kill the bees. The best spray for aphis was made of tobacco and soap wash. If they put in one pint of resin wash to the gallon and sprayed it on warm it would kill every peach aphis that it touched. The reproduction of the aphis was so rapid that it was necessary to follow it up with three sprayings, say, every other day. It would not make the slightest difference whether the spraying was done in the morning or the afternoon.

Mr. A. Phelps (Clarendon) mentioned the case of an orchard of apricots of about 100 trees which were heavily pruned this year. Six of the trees were left unpruned. This six were bearing good crops of fruit, whilst the balance of the trees were bare. He asked for an explanation.

Mr. Quinn said it appeared as though most of the fruit wood of the pruned trees was cut away. There was an advocacy of leaving the apricot with longer leaders than was generally the practice. This had resulted in a bigger setting of fruit. The work had not been carried on for sufficiently long in the non-irrigated districts at any rate for them to tell what the final comparative results would be, but it stood to reason that if they left a larger amount of fruiting wood they would get a bigger setting of fruit. If they cut the leading branches the tree attempted to repair this injury, which resulted in excessive growth, which was opposed to the setting of fruit. Possibly the gumming of the buds had something to do with the non-setting. This was almost entirely due to the operation of a fungus. Personally he could not see that it would affect pruned trees more in proportion than those unpruned. They should attempt to determine the method that would give the best fruit for the longest period and follow that.

Mr. W. Nicholls (Longwood) asked whether the mixing of Bordeaux mixture and arsenate of lead would not result in the mixture becoming too dilute.

Mr. Quinn said that in liquefying the arsenate of lead and preparing the Bordeaux, if they were mixing, say, 50galls. they should liquefy 2lbs. of arsenate of lead in a small quantity of water and pour it into the tank. The Bordeaux, after being prepared in a small volume of water, should also be poured into the tank and sufficient water added to make the 50galls.

Mr. A. J. Furriss (Longwood) thought that the fruit would become russeted as a result of these sprays being mixed and put on together.

Mr. Quinn said this had not been proved. Experiments at Lyndoch had revealed fruits in unsprayed rows as russeted as those borne by the trees in sprayed rows. The skin of the apple might be russeted by simply spraying with water, under certain weather conditions.

Mr. G. R. Laffer (Chairman Advisory Board) enjoyed the practical paper of the Horticultural Instructor. He had had some experience in these matters. In digging trenches for drainage he found that these could be done very economically with a pick possessing a double-tined end, the tines being spaced 4in. or 6in. apart. In addition to this it was necessary to have a scoop, somewhat after the style of a large fish-hook. With this an even surface could be obtained on the bottom. It was frequently laid down in text-books that orchards should be ploughed in the autumn and spring or summer. This should be determined by the district. If they ploughed their land in the autumn it would set down with the winter rains. Whether they should plough away from the trees was also to be determined by the district. He made it a rule to make the first spraying for the moth as effective as possible. He sprayed as soon as the petals fell, and again in eight or ten days' time. He believed in bandages; their use was a practice that went side by side with spraying. It was absolutely essential, especially in older orchards, to keep the stems free of rough bark. There was no doubt that shothole was more prevalent in the hills this season than it ever had been before. He had been spraying for this for several seasons, and he had had fairly good results from early winter spraying. The growing of peaches in the hills absolutely depended on winter spraying. They had wet climatic conditions, and there was a tendency for the buds to gum in the winter. This applied equally to apricots. One or two sprayings just about the time the foliage was dropping off would control this. He attributed the magnificent crop which he secured this season to this treatment. He generally sprayed apricots three or four times, and usually secured good crops of clean fruit. In growing certain early varieties of peaches they adopted the practice of never pruning the trees until they were in bloom, because if they were pruned in the ordinary way practically all the fruit buds the trees bore would be cut off. The same thing applied to apricots. To grow this fruit successfully in the hills it was necessary to spray just about the time the leaves were falling, the ordinary strength of spray being used.

GRASSES.

Mr. E. J. Oinn, of the Longwood Branch, read the following paper:—"In this district and the surrounding country, where sheep-raising and dairying are carried out, something about grasses, which might improve the carrying capacity of the land, should be of value. Doubtless, some will think that the feeding values of the grasses on their land at present are sufficient without trying anything else; but the result of a few experiments might improve the carrying capacity a good deal. The best grass plant that I know of, and which has given me the greatest satisfaction on moderately damp and fairly rich soil, is called Guinea grass. It is a vigorous and quick grower, and will stand mowing off three or four times a year or a moderate amount of grazing for seven or eight months in the year. The two which have proved next in value to Guinea grass are Cocksfoot and Prairie grass. I worked up a piece of hillside land of poor, sandy, stony soil, 3in. deep, about six years ago, and applied bonedust at the rate of 2cwts. to the acre. The season being good, I put the plants in rows, 9in. apart, by 6in. in the rows. They stooled out so that they made one broad row of solid grass about 8in. wide, and it grew to a height of 3ft. 6in., as thick as it could stand. When the seed ripened I collected it to plant elsewhere. After I collected as much seed as I wanted, I let the cow in on to the patch and she did extremely well on the straw. I sowed the seed which I collected on some gully land, with the object of getting it to grow for yearly crops of hay and greenfeed, without having to work the land up every year, so I gave it a dressing of bonedust, 1½cwts. to the acre, with the result that I had an abundance of greenfeed, and afterwards a crop of hay, which would go about 3 tons to the acre. I waited until the young grass got a fairly good start again, then gave it another dressing of 1½cwts. of bonedust to the acre for the crops of greenfeed and hay for the next year, and I continued to do that for four years with success. The grass at the present time, after a period of five years, having been continually cut for green feed and hay, looks as strong and healthy as ever. I grazed a cow on the plot on the hillside where I raised the seed for a period of three years continually, with the result that it was killed outright. Cocksfoot and Prairie grass make good feed for horses and cows as hay or chaff if cut just as the bloom has fallen ; but if left until the grain gets into a dough stage it seems to become hard and woody in the stalks and the animals will not eat it. The land on which I sowed the seed consisted of good gully black soil which could be irrigated as occasion required, so that it was capital for producing the results stated above. I planted some Cocksfoot and Prairie grass on hillside land among some fruit trees with the object of trying to produce annual crops of hay without having to work the land up every year, but by the addition of 2cwts. of bonedust to the acre I could only get moderate crops for hay every season, which I consider fairly successful ; but I noticed that when the cow was fed on the chaff cut from Cocksfoot and Prairie grass hay, with the addition of a little bran, the milk yield was better and the cream thicker than when she was fed on the same quantity of bought chaff and the same quantity of bran. Another grass which I have grown is *Panicum Crus-galli*. In the first place this came up amongst a crop of growing vegetables, and when the weather warmed up at the beginning of summer it grew with such rapidity that it killed out the vegetables ; but being short of greenfeed at the time, I allowed it to grow to a height of 4ft., when it came into flower ; then I used it as greenfeed. This grass, although a great curse in a vegetable garden, is a good plant for the production of summer greenfeed, as in six weeks from the time the plant gets above the ground it produces a crop of greenfeed on good moist soil, from 2ft. to 2ft. 6in. in height. There is one great drawback, however, it is only an annual, the seed sprouting into growth as soon as the sun warms up the ground in the spring, and growing through the summer till the first general frost comes; then it is killed outright, and does not grow again until the following spring. This makes it not nearly so valuable, to my mind, as a perennial, as it only grows about five months in the year, and then it is done. I grew *Phalaris commutata* and Chewing's Fescue together for greenfeed and hay, but they did not produce anything like the quantity or the quality, either as greenfeed or as hay, being too slow in growth for greenfeed—the *Phalaris* growing too coarse and hard for hay, the Fescue growing too thin to give any profitable results. I planted a mixture of Guinea grass and English Meadow Foxtail grasses on good soil, where it could be irrigated in the dry, summer months, with surprising results, being able to get several cuts of greenfeed and two crops for hay every year, and I can safely say that some of the best and sweetest smelling hay was produced from that plot of Guinea grass and English Meadow Foxtail, the crops averaging about 2ft. high. These experiments have been carried out on a small scale, producing fodder for only one cow and sometimes a horse, so I cannot give any estimate of how they would answer on larger areas, or how many sheep could be grazed to the acre; but I thought that this being a dairying and sheep-raising country the result of my experiments might be useful."

DISCUSSION.

Mr. F. Dadow (Mount Barker) asked whether the writer of the paper had had any experience with Japanese millet.

Mr. Oinn had tried this, but was not very satisfied with it as a fodder crop, as it could not be turned into hay successfully. It grew well, but owing to the quickness of its growth had to be used very rapidly. The stalks grew too thick and the hay went mouldy. It only seemed to stand one general cutting.

Mr. Stephenson (Mount Barker) had found *Phalaris commutata* a very good frost resister. It would stand feeding off.

Mr. T. Jacobs (Cherry Gardens) asked at what stage should Prairie grass be cut for hay. If it grew anything like to maturity it became very coarse. He also desired to know whether Mr. Oinn had had any experience with Cow grass.

Mr. Oinn said the first year he tried to make hay from Prairie grass he cut it in the same manner as they treated wheat and oats. It made a good smelling hay, but was too hard. The following year he cut it just after the flower had fallen, and the hay was good. He could not get such good results from Cow grass as from the other grasses mentioned. Guinea grass grew somewhat like the natural grasses of the hills, but it did not have such a stiff, ribby leaf. The seed was very small, and the plant also grew from roots.

Mr. Jones (Mount Barker) had chaffed Prairie grass for horses after having thrashed the seed out of it.

Professor Lowrie thought the paper a very practical one. It was one that opened up many questions that could be profitably thought over in connection with the hills district. He indorsed what Mr. Oinn said about perennial *Phalaris*. The general opinion of those who had tried the grass in South Australia and in other parts of Australia was that compared with *Paspalum* and Rhodes grasses it was the best of the introduced grasses. He was inclined to the same opinion. Of Prairie grass and Italian rye grass he had had experience. There was no doubt that Prairie grass was one of the most rapid growing grasses in the winter time, and he had seen some very excellent cuts of hay obtained from it. In South Canterbury he grew Prairie grass and rye grass on the stubble ; cut it about this time, and put it into hay or silage stacks. It was used to fatten large numbers of cattle. On the general question as to whether they could get better results with artificial than natural herbage, he was not prepared to give an opinion. If the cost of seed and the cost of cultivation in a good many cases, and the constant care that was necessary in order to get the best out of them, were expended on the natural grasses, the total grazing capacity, although probably not the hay capacity, would be perhaps not greater in the one than in the other. This was a matter that had not been worked out, and it would take many years to determine. Mr. George Riddoch had spent a good deal of money in the South-East in working it out, chiefly with perennial rye grass and trefoil. His manager was of the opinion that the natural herbage paid better. At the same time there were certain of the grasses which, by saving, they could get to grow bulk enough to cut for hay, which gave them a great advantage in enabling them to carry stock over times when other things were done. The grasses that had been mentioned were the best. He considered Cocksfoot the very best of the English grasses ; it was better than perennial rye grass. The difficulty with it, however, was that it was of little use until it was into the second year. It was necessary to conserve it during the first year. Once it was fairly established it would stand throughout the summer.

Mr. Quinn mentioned that a week or so ago he had seen a fine strip of Cocksfoot continuing the second year in the heathy land in the Tintinara district.

Mr. Oinn eight or nine years ago had 15 roots of *Phalaris commutata*, which he planted on a square rood of land. He gave it 12lbs. of sulphate of ammonia and 6lbs. of bonedust, and when it had got a fair start added about 12lbs. of superphosphate. It was regularly irrigated during the hot weather. When it had been growing about three months it was 4ft. high and very thick. It was mown off, and grew to about the same height within a month.

Professor Lowrie, in reply to a question, said Yorkshire Fog was fairly good in the hills, although it was avoided in other countries. It was a weed, because stock would not touch it if there were anything else available. It was just better than want.

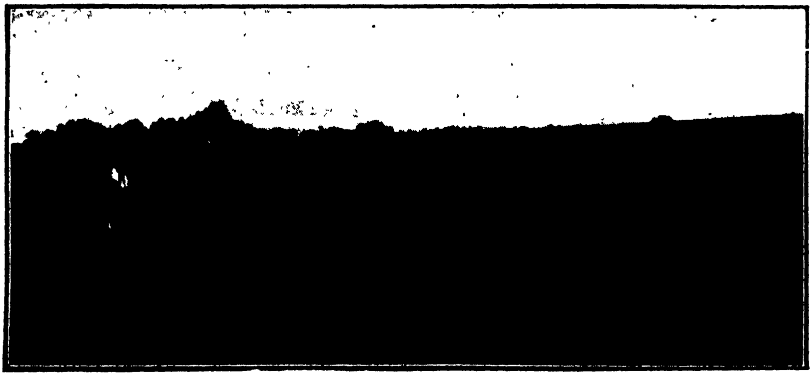
Mr. Nicholls (Longwood) disagreed. Whilst Yorkshire Fog was of little value in orchard lands, in the Mount Lofty district its feed value was good. It was considerably better grass than it had been 10 years ago. He had it growing on gully ground, and all through the summer he got a splendid growth, and the stock kept in good condition on it. They could not eat it right out.

Mr. T. Jacobs (Cherry Gardens) thought Yorkshire Fog a curse. It would completely kill out any other grasses, but there was no quality in it.

Professor Lowrie said one difficulty with Cow grass was that there was an insufficiency of seed. The natural red clover gave a much greater bulk of seed, consequently that which came into the market was rather the red clover than the Cow grass.

Mr. Monfries (Gumeracha) had had some experience with grasses. The two he favored were *Phalaris commutata* and Cocksfoot. The former would stand extremes of heat and cold. It was necessary to get the ground into good tilth, plough it again, put the small roots into the side of the furrow 6in. apart, as was done with potatoes, then cover them with the next furrow. The roller should then be put over the ground. Planting with the dibber was very expensive. Natural grasses were almost eaten out. It would pay them to manure and have smaller paddocks in which the cattle could be systematically fed. They would then reap a benefit from sowing these grasses.

(To be continued.)



Lucerne Crop, Turretfield.

THE WHEAT MARKET.

Reporting on the wheat position on October 3rd, *Beerbohm's Evening Corn Trade List* states—" According to a cable received from the St. Petersburg *Handels-Industrie-Zeitung* a few days ago, this year's Russian wheat crop is now estimated at, for the 73 Governments, 86,800,000qrs. The Central Statistical Committees' estimate of August gave the yield at 101,000,000qrs., so that the present unofficial estimate is over 14,000,000qrs. less than the earlier official one, and is even smaller than the official estimate for last year, which was 90,595,000qrs. The preliminary estimate of the Central Statistical Committee of July last was for a yield of 111,000,000qrs., and the reduction to 101,000,000qrs. in August was understood to be on account of the unfavorable harvest weather in July. As the weather since the early part of August has, on the whole, been favorable for securing the crop, it is not at all clear on what grounds there has been a further very large deterioration.

" As mentioned before the harvest in Canada is earlier than in 1912, also the railway facilities for moving the wheat from the farms are improving every year. The exports from Canada in the season ending August 31st last amounted to nearly 15,000,000qrs., and this season's exports are likely to exceed that quantity by 1,000,000qrs. to 2,000,000qrs. Cables from Toronto of yesterday's date state that 40 per cent. of the wheat crop is already threshed, and that the average yield throughout the Western Provinces is estimated at 20bush. per acre. On this basis the yield for the whole of Canada would be about 215,000,000bush.

THE WORLD'S VISIBLE WHEAT SUPPLY ON OCTOBER 1st.

	European. Qrs.	U.S/Canada Qrs.	Total. Qrs.	Eng. Aver'ge. Price.
1913	8,385,000	10,090,000	18,475,000	31/6
1912	8,180,000	6,330,000	14,510,000	31/7
1911	9,140,000	8,835,000	17,975,000	32/6
1910	11,360,000	7,715,000	19,075,000	30/1
1909	6,730,000	4,880,000	11,610,000	32/9
1908	6,985,000	6,750,000	13,735,000	31/6
1907	7,660,000	7,750,000	15,410,000	31/8
1906	8,690,000	7,500,000	16,190,000	25/9
1905	8,200,000	4,050,000	12,255,000	26/9
1904	9,045,000	4,175,000	13,215,000	29/10
1903	7,975,000	4,530,000	12,505,000	27/-
1902	6,890,000	6,120,000	13,010,000	26/6
1901	8,475,000	7,500,000	15,975,000	25/10
1900	8,280,000	10,800,000	19,080,000	28/9
1899	7,675,000	8,600,000	16,575,000	25/6
1898	4,800,000	3,440,000	8,240,000	25/9
1897	5,865,000	4,720,000	10,585,000	33/11

Date.		LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
Oct.	6	—	3/6½	3/6¼ to 3/6½	3/5½ to 3/6
	7	Quiet	3/6	Do.	Do.
	8	Dull and neglected	Do.	Do.	Do.
	9	No demand ; Jan.-Feb. buyers, 4/5¼ ; Liverpool very dull, lower to sell	Do.	Do.	Do.
	10	Steady, but quiet ; Liverpool quiet	Do.	3/6½ old, 3/5¼ new	3/6½ old, 3/5½ new
	11	Quiet ; Liverpool dull ; Australian, afloat, 4/5½	Do.	Do.	Do.
	13	—	3/6 old, 3/5 new	3/6 to 3/6¼	3/6 to 3/6¼
	14	Dull, no demand	Do.	Do.	Do.
	15	Dull and neglected	3/5½ to 3/6 old, 3/5 new	Do.	3/6
	16	Dull and neglected ; Liverpool dull, no demand ; Jan.-Feb. sellers 4/5¼	Do.	3/6	Do.
	17	Dull and neglected	3/5 to 3/5½ old, 3/4½ to 3/5 new	3/5½	3/5½
	18	—	3/5 old, 3/4½ to 3/4¾ new	Do.	Do.
	20	—	3/5 old, 3/4½ new	3/5 old, 3/4½ new	3/5 old, 3/4½ new
	21	Dull	Do.	Do.	Do.
	22	Steady, but quiet	Do.	Do.	Do.
	23	Dull, easier tendency ; Liverpool quiet : Jan.-Feb., sailer, buyers 4/4⅛	Do.	Do.	Do.
	24	Dull, no demand	Do.	Do.	Do.
	25	Steady, but quiet ; Liverpool steadier tone ; Australian new crop, buyers 4/4⅛	Do.	Do.	Do.
	27	—	Do.	Do.	Do.
	28	Steadily held, not active	Do.	Do.	Do.
	29	Firmly held, inactive ; Liverpool firm, quiet ; Jan.-Feb. 4/4½	Do.	Do.	3/5 old, 3/3½ to 3/4 new
	30	Steady, quiet	Do.	Do.	Do.
	31	Firm, quiet ; Liverpool dull, easier tendency	Do.	Do.	Do.
Nov.	1	Firm, fair inquiry ; Liverpool firm ; Jan. Feb. 4/4⅝	Do.	3/5 old, 3/4½ new	3/5 to 3/5½ old, 3/4 new
	3	—	Do.	Do.	Do.
	4	Steadily held, not active	Do.	Do.	3/5 old, 3/4½ new
	5	Quiet, easier tendency ; Liverpool easier, more disposition to sell	Do.	Do.	Do.

Steamer Freights.—(November 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 31s. 3d. per ton (10d. per bushel), prompt or new season ; to South Africa, 27s. 6d. per ton ($8\frac{9}{10}$d. per bushel), prompt or new season. Parcels, Port Adelaide to London-Liverpool, or Continent, 25s. per ton (8d. per bushel) ; Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel) ; to Sydney, 10s. 6d. per ton (3¼d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 31s. 3d. to 32s. per ton (10d. to $10\frac{3}{10}$d. per bushel), new crop ; South Africa, 26s. 3d. per ton ($8\frac{2}{5}$d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

The General Manager of the Produce Department reports on November 1st—

BUTTER FACTORY.

There was a decided increase in the quantity of cream received last month, and the quality was excellent. The demand for butter was well maintained, but prices eased slightly. The present rates are—Superfine, 1s. 0½d. per lb ; pure creamery, 11½d. per lb.

A. W. Sandford & Co., Limited, report on November 1st—

BUTTER.—Supplies of butter and cream again increased during October, while prices in top factory and creamery butters are practically as high as they were a month ago. Best factory and creamery, fresh in prints, are selling at 11d. to 1s. 1d. per lb. ; choice separators and dairies, 9d. to 10d. ; store and collectors' lines, 8d. to 8½d.

EGGS.—There is no material alteration to record either in the position or in values, and prices throughout the Commonwealth remain stationary. Guaranteed new-laid hen, 8d. per dozen ; duck, 9d.

CHEESE.—There was a very heavy turnover during the month of October, both local and export traders purchasing freely. Present rates are from 5½d. to 6d. per lb. for large to loaf.

HONEY.—Buyers are still operating for prime samples at 3¼d. per lb., but second grades are neglected. Beeswax, very saleable at 1s. 2d.

ALMONDS.—Stocks are practically cleared, and the market is likely to open out strong for the new season's crop. Brandis, 6d. ; mixed soft shells, 5½d. ; hard shells, 3d. ; kernels, 1s. 5½d. per lb.

BACON.—The high prices previously reported continue to rule, and values are even a little firmer than a month ago.

LIVE POULTRY.—Rates have kept up remarkably well, supplies not being nearly equal to trade requirements. Good table roosters brought 3s. 6d. to 4s. each ; plump hens and nice-conditioned cockerels, 2s. 3d. to 3s. ; geese, 4s. 6d. to 5s. 6d. ; ducks, 2s. 4d. to 3s. 6d. ; turkeys, from 8d. to 11d. per lb. live weight for fair to prime table birds.

POTATOES AND ONIONS.—The weather conditions of the Adelaide plains this spring have been highly favorable to the growth of potatoes and onions. Heavy crops, and therefore moderate prices, are freely anticipated. There are still large quantities of old potatoes available, but many of these will apparently not reach the market this season. Onions—There is no alteration to report in this line, and the new season's crop is now delivering. Present quotations are—Potatoes, Gambier's, £3 2s. 6d. per ton of 2,240lbs. on truck Adelaide or Port ; 3s. 9d. to 4s. 6d. per cwt. in the market. Onions.—Gambier's, £7 5s. per ton of 2,240lbs. on truck Adelaide or Port ; new locals, 10s. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of October, 1913, also the average precipitation to the end of October, and the average annual rainfall.

Station.	For Oct., 1913.	To end Oct., 1913.	Av'ge. to end Oct.	Av'ge. Annual Rainfall
Far North and Upper North.				
Oodnadatta	0·56	5·43	3·94	4·76
Tarcoola	1·62	6·88	6·48	7·58
Hergott	2·24	4·73	4·97	6·04
Farina	2·06	5·33	5·62	6·70
Leigh's Creek	1·52	5·98	7·32	8·66
Beltana	1·30	4·16	7·77	9·22
Blinman	2·19	5·77	11·16	12·85
Hookina	1·78	6·28	—	—
Hawker	1·69	6·57	10·57	12·22
Wilson	1·90	6·81	10·34	11·78
Gordon	1·58	6·09	8·97	10·26
Quorn	1·26	6·74	12·30	13·78
Port Augusta	1·37	5·37	8·26	9·46
Port Augusta W.	1·29	5·46	8·24	9·36
Bruce	1·42	6·09	8·85	10·01
Hammond	1·53	6·80	10·02	11·46
Wilmington	1·65	10·70	16·38	18·26
Willowie	1·70	6·06	10·58	11·91
Melrose	1·96	13·13	20·90	23·04
Booleroo Centre	1·58	7·43	14·01	15·83
Port Germein	1·53	7·78	11·28	12·84
Wirrabara	2·92	14·13	17·01	18·91
Appila	1·90	7·87	13·21	15·08
Cradock	1·81	7·02	9·62	10·86
Carrieton	2·27	6·73	10·61	12·22
Johnburg	2·33	6·31	8·77	10·21
Eurelia	1·71	5·82	11·56	13·24
Orroroo	1·21	6·92	11·78	13·42
Black Rock	1·41	6·97	10·59	12·25
Petersburg	1·09	8·64	11·31	13·07
Yongala	1·82	7·88	12·09	13·94
North-East.				
Ucolta	1·42	5·45	—	—
Nackara	—	6·61	—	—
Yunta	2·23	6·33	6·94	8·22
Waukaringa	3·09	5·81	6·74	7·94
Mannahill	4·01	9·08	7·05	8·46
Cockburn	1·50	4·25	6·74	7·97
Broken Hill, NSW	2·23	4·34	8·24	9·62
Lower North.				
Port Pirie	1·39	8·64	11·82	13·21
Port Broughton	1·46	9·82	12·97	14·33
Bute	1·81	12·37	14·12	15·42
Laura	2·49	12·41	16·33	18·22
Caltowie	2·58	12·00	15·27	17·27
Jamestown	2·39	12·16	15·39	17·46
Gladstone	2·72	11·77	14·23	16·00
Crystal Brook	1·87	10·03	13·99	15·62
Georgetown	3·38	13·95	16·38	18·32
Narridy	1·75	8·71	15·08	16·79
Redhill	1·60	10·79	15·18	16·79
Spalding	1·93	13·83	17·87	20·25
Lower North—*continued*.				
Gulnare	2·32	11·79	17·83	19·74
Bundaleer W. Wks.	2·16	11·42	15·22	17·29
Yacka	1·38	10·14	13·71	15·27
Koolunga	2·18	9·98	14·30	15·94
Snowtown	1·50	10·02	14·21	15·70
Brinkworth	1·78	12·92	13·93	15·48
Blyth	1·84	12·63	14·75	16·34
Clare	2·19	19·84	22·03	24·30
Mintaro Central	2·11	16·46	20·00	21·99
Watervale	2·96	22·29	24·66	27·17
Auburn	2·33	16·30	21·95	24·25
Hoyleton	2·41	12·39	16·15	17·96
Balaklava	1·52	10·06	14·31	16·03
Port Wakefield	1·60	9·36	11·91	13·13
Terowie	1·55	8·07	11·79	13·71
Yarcowie	1·74	10·53	12·19	13·91
Hallett	1·42	12·12	14·44	16·40
Mount Bryan	1·24	14·20	14·19	15·73
Burra	1·29	13·05	16·06	17·82
Farrell's Flat	1·86	12·68	17·09	18·87
West of Murray Range.				
Manoora	2·14	13·29	16·30	18·09
Saddleworth	2·42	14·92	17·65	19·69
Marrabel	2·14	13·54	17·04	18·94
Riverton	1·71	15·33	18·44	20·48
Tarlee	2·06	14·36	15·56	17·48
Stockport	2·58	15·10	14·15	15·89
Hamley Bridge	2·24	14·15	14·66	16·45
Kapunda	1·68	16·97	17·72	19·67
Freeling	2·13	17·79	15·95	17·85
Greenock	1·98	17·79	19·15	21·46
Truro	2·04	20·76	17·78	19·74
Stockwell	1·65	15·93	18·11	20·30
Nuriootpa	1·65	14·94	19·03	21·25
Angaston	1·91	19·97	19·87	22·25
Tanunda	2·23	20·86	20·04	22·28
Lyndock	2·36	17·83	20·81	23·01
Adelaide Plains.				
Mallala	1·86	13·32	15·17	16·88
Roseworthy	2·41	13·16	15·51	17·31
Gawler	3·03	14·66	17·29	19·21
Two Wells	1·88	10·69	14·78	16·36
Virginia	2·00	12·22	15·83	17·58
Smithfield	3·22	14·27	15·37	17·30
Salisbury	2·06	13·95	16·75	18·57
North Adelaide	3·23	16·68	19·36	21·49
Adelaide	2·45	14·36	18·96	21·04
Brighton	2·12	14·21	17·88	19·93
Glenelg	1·89	13·28	16·57	18·35
Magill	2·39	15·94	23·27	25·69
Glen Osmond	2·94	18·70	22·92	25·20
Mitcham	3·05	17·09	21·39	23·47
Belair	2·63	19·40	26·15	28·64

RAINFALL—*continued.*

MOUNT LOFTY RANGES.

Station.	For Oct., 1913.	To end Oct., 1913.	Av'ge. to end Oct.	Av'ge. Annual Rainfall
Houghton	—	22·79	—	—
Teatree Gully	3·27	18·17	25·40	28·19
Stirling West	3·68	31·10	42·76	46·70
Uraidla	3·27	27·74	40·68	44·35
Clarendon	3·02	20·84	30·67	33·67
Morphett Vale	2·25	15·16	21·00	23·32
Noarlunga	2·27	12·17	18·51	20·28
Willunga	2·72	18·23	23·85	25·98
Aldinga	2·04	14·43	18·47	20·34
Normanville	1·91	13·96	18·92	20·65
Yankalilla	2·11	17·46	20·97	22·78
Cape Jervis	1·65	10·56	14·96	16·34
Mount Pleasant	3·12	21·10	24·57	26·87
Blumberg	2·15	18·08	26·80	29·38
Gumeracha	4·44	24·37	30·32	33·30
Lobethal	3·65	23·39	32·56	35·38
Woodside	2·58	23·56	29·18	31·87
Hahndorf	3·79	25·84	32·46	35·45
Nairne	2·61	19·40	26·32	28·83
Mount Barker	3·65	23·74	28·31	30·93
Echunga	4·27	23·87	30·12	32·83
Macclesfield	3·93	23·94	27·96	30·72
Meadows	3·97	27·76	32·39	35·52
Strathalbyn	3·25	18·13	17·50	19·28

MURRAY FLATS AND VALLEY.

Station.	For Oct., 1913.	To end Oct., 1913.	Av'ge. to end Oct.	Av'ge. Annual Rainfall
Wellington	2·98	12·30	13·29	15·01
Milang	1·58	9·22	14·57	16·08
Langhorne's Bdge	1·94	11·10	13·53	15·27
Tailem Bend	2·90	11·81	—	—
Murray Bridge	3·71	15·98	12·65	14·32
Callington	2·49	13·32	14·06	15·65
Mannum	1·39	9·62	10·45	11·67
Palmer	2·00	14·11	13·86	15·60
Sedan	1·84	12·74	10·66	11·92
Blanchetown	1·43	6·82	9·30	10·71
Eudunda	2·04	15·62	15·42	17·33
Sutherlands	1·52	9·55	9·24	10·60
Morgan	1·00	6·37	7·87	9·29
Overland Corner	1·68	10·59	9·67	11·42
Renmark	1·81	11·14	9·24	10·93
Loxton	2·14	—	—	—

WEST OF SPENCER'S GULF.

Station.	For Oct., 1913.	To end Oct., 1913.	Av'ge. to end Oct.	Av'ge. Annual Rainfall
Eucla	0·91	6·46	9·04	10·13
White Well	1·40	6·55	8·15	9·67
Fowler's Bay	1·92	9·88	11·25	12·11
Penong	1·47	8·71	10·77	11·93
Murat Bay	1·46	9·49	—	—
Smoky Bay	1·76	10·43	—	—
Streaky Bay	1·48	10·51	14·25	15·31
Port Elliston	1·85	8·69	15·38	16·49

WEST OF SPENCER'S GULF—*continued.*

Station.	For Oct., 1913.	To end Oct., 1913.	Av'ge. to end Oct.	Av'ge. Annual Rainfall
Port Lincoln	1·10	11·28	18·44	19·88
Tumby	1·98	10·64	13·72	15·00
Carrow	2·15	9·91	—	—
Cowell	1·55	8·40	10·69	11·76
Point Lowly	1·74	6·26	10·71	12·21

YORKE'S PENINSULA.

Station.	For Oct., 1913.	To end Oct., 1913.	Av'ge. to end Oct.	Av'ge. Annual Rainfall
Wallaroo	2·10	12·10	12·83	14·05
Kadina	1·90	11·15	14·62	15·88
Moonta	1·82	12·34	13·92	15·22
Green's Plains	1·84	11·53	14·54	15·73
Maitland	1·95	13·17	18·34	20·08
Ardrossan	1·64	12·04	12·66	13·89
Port Victoria	2·56	10·76	13·84	15·20
Curramulka	2·87	13·55	17·04	18·51
Minlaton	3·00	11·72	15·98	17·41
Stansbury	2·04	13·07	15·66	17·06
Warooka	2·30	10·98	16·44	17·71
Yorketown	2·79	11·28	16·04	17·47
Edithburgh	2·91	13·21	15·00	16·48

SOUTH AND SOUTH-EAST.

Station.	For Oct., 1913.	To end Oct., 1913.	Av'ge. to end Oct.	Av'ge. Annual Rainfall
Cape Borda	0·78	15·87	23·34	25·09
Kingscote	1·67	13·26	17·35	18·95
Penneshaw	1·70	13·77	19·63	21·34
Cape Willoughby	1·51	15·19	17·63	19·69
Victor Harbor	1·81	12·93	20·30	22·18
Port Elliot	2·01	12·87	18·46	20·33
Goolwa	1·72	12·17	16·21	17·93
Pinnaroo	2·09	12·03	14·63	16·74
Parilla	1·54	11·99	—	—
Lameroo	3·06	16·00	14·51	16·55
Parrakie	1·82	10·92	—	—
Geranium	2·59	13·63	—	—
Peake	2·08	13·60	—	—
Cooke's Plains	2·50	12·47	13·15	14·74
Meningie	1·27	11·80	17·02	18·87
Coonalpyn	2·75	14·55	15·60	17·49
Tintinara	1·94	12·36	16·57	18·78
Keith	2·24	16·11	—	—
Bordertown	2·00	15·96	17·39	19·76
Wolseley	1·94	15·40	15·84	17·72
Frances	2·35	14·63	18·26	20·74
Naracoorte	1·83	15·73	20·13	22·60
Penola	1·86	15·45	23·91	26·78
Lucindale	1·37	13·34	21·00	23·32
Kingston	1·21	15·61	22·32	24·73
Robe	1·31	15·55	22·61	24·69
Beachport	1·07	18·86	25·22	27·51
Millicent	1·61	22·06	26·66	29·25
Mount Gambier	2·10	21·69	28·41	32·00
C. Nrthumberland	1·83	16·83	24·01	26·63

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Nov.	Dec.			Nov.	Dec.
Amyton	*	—	—	Goode	†	—	—
Angaston	*	8	13	Greenock	*	—	—
Appila-Yarrowie	*	—	—	Green Patch	†	17	—
Arden Vale & Wyacca	*	—	—	Gumeracha	558	11	9
Arthurton	*	—	—	Hartley	558-9	12	10
Balaklava	†	—	—	Hawker	*	10	8
Bandon	†	—	—	Hookina	532	11	9
Beetaloo Valley	*	—	—	Inman Valley	559	—	—
Belalie North	†	8	13	Ironbank	†	14	12
Berri	547-9	15	13	Julia	*	—	—
Blackwood	556	10	8	Kadina	*	11	9
Blyth	*	15	20	Kalangadoo	*	8	13
Booleroo Centre	†	—	—	Kanmantoo	*	8	13
Borrika	*	—	—	Keith	562	15	13
Bowhill	*	—	—	Kingscote	†	4	2
Bowmans	*	13	11	Koppio	*	13	11
Burra	*	14	12	Kybybolite	562	13	11
Bute	*	—	—	Lameroo	551	—	—
Butler	544	—	—	Leighton	†	—	—
Caltowie	*	8	13	Lipson	*	—	—
Canowie Belt	*	—	—	Longwood	561	12	10
Carrieton	†	13	11	Loxton	*	—	—
Cherry Gardens	557	11	9	Lucindale	*	15	20
Clanfield	†	—	—	Lyndoch	†	—	—
Clare	538	14	12	MacGillivray	†	—	—
Clarendon	*	10	8	Maitland	544	6	4
Claypan Bore	550	11	—	Mallala	†	3	1
Colton	†	15	13	Mangalo	*	15	13
Coomandook	550	—	—	Mannum	*	29	27
Coomooroo	532	15	13	Meadows	*	11	9
Coonalpyn	551	—	—	Meningie	†	15	13
Coonawarra	*	—	—	Millicent	*	11	9
Coorabie	544	8	13	Miltalie	*	8	13
Cradock	*	—	—	Minlaton	*	13	11
Crystal Brook	533	—	—	Mitchell	545	15	13
Davenport	†	—	—	Monarto South	551	8	—
Dawson	*	—	—	Monteith	†	—	—
Dingabledinga	*	14	12	Moonta	†	—	—
Dowlingville	*	—	—	Moorlands	*	—	—
Elbow Hill	545	—	—	Morchard	*	15	13
Forest Range	558	13	11	Morgan	551	8	13
Forster	*	—	—	Morphett Vale	*	—	—
Frances	*	14	12	Mount Barker	*	12	10
Freeling	539	—	—	Mount Bryan	*	8	13
Friedrichswalde	540	15	13	Mount Bryan East	535	1	6
Gawler River	541	—	—	Mount Gambier	†	8	—
Georgetown	*	8	13	Mount Pleasant	*	14	12
Geranium	*	29	27	Mount Remarkable	†	12	10
Gladstone	535	—	—	Mundoora	535	—	—
Glencoe	*	—	—	Myponga	561	—	—

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Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Nov.	Dec.			Nov.	Dec.
McNamara Bore	†	—	—	Sherlock	*	—	—
Nantawarra	541	12	10	Spalding	538	21	—
Naracoorte	*	8	13	Stockport	542	—	—
Narridy	*	—	—	Strathalbyn	†	—	—
Narrung	*	—	—	Sutherlands	*	8	13
North Booborowie	*	—	—	Tarcowie	533	11	9
North Bundaleer	†	—	—	Tatiara	*	1	6
Northfield	†	4	2	Tintinara	563	—	—
Orroroo	*	—	—	Two Wells	543	—	—
Parilla	552	—	—	Uraidla and Summert'n	*	3	1
Parilla Well	*	—	—	Utera Plains	546	8	13
Parrakie	553	1	6	Waikerie	555	10	—
Paskeville	*	13	11	Warcowie	*	—	—
Penola	*	1	6	Watervale	543	—	—
Penong	*	8	13	Wepowie	*	—	—
Petina	*	—	—	Whyte-Yarcowie	538	—	—
Pine Forest	†	11	9	Wilkawatt	*	—	—
Pinnaroo	553	—	—	Willowie	*	7	5
Port Broughton	535-6	14	12	Willunga	*	1	6
Port Elliot	561	15	20	Wilmington	*	12	10
Port Germein	*	15	—	Wirrabara	533	15	13
Port Pirie	536	—	—	Wirrega	564	29	27
Quorn	532	15	—	Woodside	*	—	—
Redhill	537	11	9	Wynarka	†	—	—
Renmark	†	—	—	Yabmana	*	—	—
Riverton	542	—	—	Yadnarie	547	8	13
Roberts and Verran	*	—	—	Yallunda	547	8	—
Saddleworth	*	21	19	Yongala Vale	*	10	8
Salisbury	542	4	2	Yorketown	*	8	13
Shannon	*	—	—				

*No report received during the month of October. † Formal report only received.

Where Branch meetings are mainly occupied with the reception of reports of Congress by delegates these will be classed as "formal."

ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

December 10th and January 14th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD)

Coomooroo, October 10.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. G. B. Lillicrapp (chair), E. Brice, R. G. and A. Polden, W. Barber, R. Brice, C. Phillis, L. Avery, E. D. Kirkland, J. Polden, W. M. Robertson (Hon. Sec.).

Harvesting Machinery.—The Hon. Secretary, in initiating a discussion on this subject, advised members to prepare their machinery for the harvest several weeks before the work began. Mr E. Brice advised cleaning all bearings of oil and grease accumulations and filling the oilcups with kerosine. Mr. Lillicrapp recommended screwing up all nuts and bolts and to take care that the oil was running freely. Members were divided in opinion as to whether it was better to clean the bearings of oil accumulations immediately after harvesting or to leave these on during the time the machines were not in use.

Hookina, October 21.

(Average annual rainfall, 12in.)

Present.—Messrs. D. E. Madigan (chair), P. and B. Murphy, H. Huddleston, J. Henschke, C. F. Stone, P. Kelly, jun., J. Carn, S. Stone (Hon. Sec.), and four visitors.

Farm Improvements.—Mr. J. Henschke contributed a paper in which he said that the first essential in connection with an unimproved farm was the selection of permanent water. A bore could be put down more quickly and with less expense than a well, and when water was struck a windmill could be erected and a large storage tank provided. The property should be fenced with either wire netting or six wires, and the farm divided into small paddocks as soon as possible. Attention should then be given to the homestead, which should be comfortable. Where good holding ground was available a dam should be sunk in every paddock, as stock did better on rainwater. The household supply should be conserved in an underground cement tank. Fruit and vegetables should be grown, and no farm should be without a blacksmith's shop.

Quorn, October 18.

(Average annual rainfall, 13·78in.)

Present.—Messrs. R. Thompson (chair), Noll, Bury, Schulze, Brewster, Cook, Jago, Britza, Patten (Hon. Sec.).

Conservation of Fodder.—Mr. Noll read a short paper on this subject, in which he stated that during seasons when there was an abundance of feed and good crops, farmers should store up enough fodder to tide them over one or two bad seasons. Where there was plenty of herbage, wild oats, thistles, &c., a pit or stack of ensilage should be provided. An extra stack of hay, if not needed, could be sold at a high figure when hay was scarce in a bad season. Cocky chaff should be gathered and covered with straw. If the farmer used the harvester, the binder should be run over the stubble and the straw cut and stacked, which could be chaffed as occasion arose. Members generally considered the advice sound.

Tarcowie, October 16.

(Average annual rainfall, about 15½in.)

PRESENT.—Messrs. F. Sanders (chair), J. Symons, J. R. G. Thomas, A. Dempster, D. Murphy, M. McCarthy, J. Dempster, J. Breuer, C. Horton, D. Butterick, A. Shrowder, W. Ninnis, T. Ninnis, J. Smith, M. Murphy (Hon. Sec.), and six visitors.

FEEDING AND BREEDING HORSES.—Mr. J. P. Smith read a paper on this subject. The young stock, he said, suffered most when feed was short, with the result that they fell away in condition, became rough in the coat, and very susceptible to disease. The practice of breeding Shires on the so-termed Clydesdales, he thought, would tend to improve the horses. The heavyweight horse, with a good body and capable of moving well, was best. There had been pure-bred Clydesdales in this State, and the foals by these from local mares showed no marked improvement. South Australia did not possess sufficient good horses to warrant the compilation of a Stud Book. Horses registered in such a book should be passed by a board composed of competent judges and two qualified veterinary surgeons. In his opinion the best animals were bred from the common mare. High prices should not be paid for brood mares; the money was better spent in the purchase of a good stallion from one of the other States, where they were bred. When rearing horses it was advisable to breed the best. Mares with foals should not be kept at work too long without the foals being allowed to suck; this frequently caused milk fever. The foals would probably scour, however, if they drank from the mares in a heated condition. Regular feeding was essential. Standing on wet manure was bad for the feet and legs of the foals. Chaff for young foals should be damped and bran added. Farm horses during the summer should receive plenty of chaff and bran and small quantities of oats. The latter should be cut with a binder and stacked. For winter feeding they should receive plenty of good hay chaff, with boiled barley and bran added. Eight hours work per day was quite sufficient. The animals were better watered before they were fed; they were then not so likely to suffer from colic. Well water was preferred. Rock salt should be kept in the manger, and each animal given Epsom salts once a week during the summer. Collars should be kept in good order; when they wore out they should be relined without hair. Backbands and spiders kept the draught in the correct place. He thought the stamp of horses in this district had deteriorated during the last 20 years.

Wirrabara, October 18.

(Average annual rainfall, 18·91in.)

PRESENT.—Messrs. J. Hollitt (chair), E. J. Stevens, E. Kavanagh, W. Marner, S. Thiselton, P. and H. Lawson, W. H. Stevens, E. Hollitt, C. H. Curnow, C. T. H. Borgas, F. T. Jettner, H. Jericho, E. H. Piper, W. Bowman, O. and H. Woodlands, R. Curtiss, E. Pitman, P. R. Hoskins, P. J. Curnow, J. Fitzgerald, and H. R. Woodlands (Hon. Sec.).

COLD STORAGE OF FRUIT AND EGGS.—Mr. H. E. Woodlands read a paper, in which he drew attention to the advantages that would follow the erection of a cool store, on the co-operative principle, in this district. In the event of the market being glutted, which was not at all an infrequent occurrence, growers could store their fruit until such time as prices improved. He mentioned an instance where apples had been purchased at 2s. 6d. per case, stored for 27 weeks at a cost of 2s. 2½d. per case for storage, and sold at 10s. to 12s. per case. The approximate cost of erecting a local store, to hold 5,000 cases, was £1,500. The bulk of the fruit grown in this district was marketed within four months. With cool store accommodation growers could extend their selling season for pears to seven months, and for apples to 12 months. Peaches and apricots, if carefully packed before they were ripe, could be kept for from one to three weeks. Eggs also might be stored when prices were low, and sold when the market had improved. Mr. J. Fitzgerald advocated the co-operative erection of a cool store in the district. Mr. P. J. Curnow thought the district was not yet in a position to do this.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Crystal Brook, October 11.

(Average annual rainfall, 15·62in.)

PRESENT.—Messrs. W. W. Lovelock (chair), H., S., and E. Billinghurst, A. E. Cooke, A. E. S. Clarke, W. S. Carmichael, H. Growden, R. Heaslip, J. H. Hill, W. Jasper,

T. L. Kelly, A. Macdonald, J. Pridham, R. R. Shaw, G. A. Solomon, J. Teakle, W. J. Venning, M. and B. Weston, A. J. L. Wilson, J. B. Greig, C. J. Jenner, G. Gum, A. J. Dennis, A. Munday, F. E. Burgess, and W. W. Robinson (Hon. Sec.)

Pig-Raising.—Mr. Hill read the following paper:—"With good management pig-raising is one of the most profitable lines on the farm. Proper attention and regular and liberal feeding are essential. The farmer should select a convenient spot on a piece of rising land for the stys or pens; the number of these should be according to the number of pigs kept. He should have about 10 acres divided into three paddocks, fenced with netting with barb wire on top and one or two rows of the same about 3in. and 6in. from the bottom, which will keep the pigs from rooting up the netting. These paddocks should have a water frontage, if there is a running stream on the farm, as the pigs do better when they can wallow in water in hot weather. The paddocks should be sown with fodders and fed off alternately, which is a great saving in the cost of feeding. In this district I find barley and rape do well, but where lucerne or root crops can be grown I would prefer laying one paddock down in this for summer feeding when the barley and rape are done. A straw stack should be built in a small paddock, which should enclose the pens and abut on the three grazing paddocks. Dry sows or any surplus pigs do better running out and camping at the stack than penned up. To achieve the best results the pens must be kept thoroughly clean. They should be built of stone, about 9ft. by 8ft. and 6ft. high, well-ventilated, and with a straw roof, as it is much cooler in summer and warmer in winter. Pigs must be kept warm in cold weather or they will not put on flesh. The breeding-pens should have a railing of jarrah about 6in. by 2in. placed about 6in. from the wall and floor so that the sows cannot crush or smother the pigs at the time of farrowing. The floors of the pens should be of brick and well-drained, as the brick is not so cold as flags or concrete. Water should be laid on handy to the pens to save labor. A 200gall. tank with the top cut out makes a good receptacle in which to mix the feed. I strongly advise farmers to think not 'how cheap' but 'how good' when selecting breeding stock. Try to obtain them from a large litter and of a good breeding strain. A great deal of the misfortune in the pig-raising has been due to weedy and mongrel-bred stock to start with, in-breeding, and lack of attention. Cross-breeding may be all right with some, but be sure and have pure breeds on either side. Personally I prefer the pure-bred Berkshire, but when we have customers we must breed to suit their requirements. The sow should be roomy, long, and deep, with broad loins and strong back; she will then have the carrying capacity for her pigs. My experience has been that the long and roomy sow will usually produce more pigs than the short sow. If selecting Berkshires see that the markings are right, and that the ears are set on well, not too large and loppy, and that the nose is not too long. There seems to be a tendency with the Berkshire breeders of to-day to get too much nose on this breed of pig. The boar is the most important member of the herd, as is the sire in the breeding of all stock. He should be a pure-bred animal of the very best type obtainable; well set on his legs and active. Like the sows, he should not be mated too young, but always kept in good condition. A better percentage of pigs and more robust and healthy litters will be secured from a boar in good condition than one thin and weak. If handled carefully and kindly they do not become savage. When rearing stud pigs careful mating is required. Do not let the sow rear too many. Thin out the smallest and those that are not marked too well, and sell nothing but the best for stud purposes. A small yard should be erected so that the young pigs can get under and away from the sows. With a little coaxing the little ones will start to feed on soft feed at about three weeks old; by the time they are eight weeks old they should be fit to wean. They will be feeding well, and will have grown far better than if left entirely to the sow to feed. It is a big mistake to rush into the pig-breeding just when there is a scarcity of pigs in the market, as often by the time one gets to work the market is down. Have the sows and boar always on hand and breed them all the year round; there is always a fair sale for well-bred and well-grown pigs. Sow a few acres of barley on well-cultivated and clean fallow. In an average year this will give a good return. I prefer to grind the barley as fine as possible. Soak it in a tank or barrel supplied for the purpose mixed with the skim milk and slops, &c., from the house. A little wheat headings or grain should be put down for them to pick at; peas also make an ideal feed. If the pig is not worth feeding it is not worth rearing. No animal on the farm will pay so well for its feed. When weaning stud pigs, which should always be put on the market in good order, cattle food is a good thing to use. They thrive well on it, and it puts on a nice glossy coat. Mix it with a little skim milk and pollard. The Berkshire is the most favored pig in Australia; it is a good doer and gives a good amount of lean streaks in the bacon, and is second to none in shape of ham. The meat is sweeter and finer in the grain, and not so coarse and stringy as is the case with some of the other breeds." Mr. Venning thought a great deal depended on cleanliness and the selection of the breeding stock. Inferior wheat could well be disposed of by feeding it to pigs. Mr. Heaslip thought a Berkshire-White Yorkshire cross better than the pure Berkshire. The White Yorkshire was not so oily and developed faster. Mr. Teakle thought the Yorkshire-Berkshire the best cross. Mr. Shaw thought pig-raising was profitable if well carried on. Good feeding, cleanliness, and proper mating were essential. Mr. Dennis considered the Essex the most profitable pig. It grew more quickly than the Berkshire. Refuse from the house made excellent feed; soaked or steamed corn sweetened with pollard was good for topping off. They should be given as much as they would eat for about a fortnight before selling. In reply, Mr. Hill said that while the Yorkshire might grow a little more quickly than the Berkshire, the meat was stringy. The Poland-China carried too much bone. If the sow were given a certain amount of meal at the time of farrowing she would not devour her young. Peas were an excellent forcing food.

Gladstone, October 4.

(Average annual rainfall, 16in.)

Present.—Messrs. R. E. Lines (chair), Henshaw Jackson (wool expert), J. H. Sargent, W. Brayley, T. Mutter, F. Mutter, J. Page, R. Peters, H. Fay, E. H. Davies, S. Masters, J. Coe, R. Coe, J. Fisher, G. Fisher, A. E. Dinning (Hon. Sec.), and 13 visitors.

Sheep.—The Wool Instructor to the School of Mines (Mr. Henshaw Jackson) delivered an interesting address on this subject, dealing in detail with the results of experiments he had been conducting in connection with the hand-feeding of sheep.

Mount Bryan East, October 11.

(Average annual rainfall, 15·81in.)

Present.—Messrs. J. Thomas (chair), R. F. Thomas, L. and B. Weller, W. Hughes, E. Wilks, W. Campbell, H. and F. Trallagar, J. Doyle, (Hon. Sec.), and two visitors.

Pastures.—In a short paper on this subject the Chairman said that during the past year or two feed in the district was becoming thinner and possessed less body than it had formerly. The rainfall had been lighter than usual, and the natural agencies—temperature, wind, &c.—had had the opportunity of restoring the soil to fertility during these somewhat lean years, with the result that better yields would again be secured with a return of the normal rainfall. If the feed became at all short it was advisable to reduce the stock and avoid eating out the grass. It was a good indication that pastures were being properly handled when fat stock could be marketed in or out of season. Some members had found the practice of keeping ewes much more profitable than wethers.

Mundoora, October 22.

(Average annual rainfall, 14·11in.)

Present.—Messrs. W. J. Shearer (chair), C. E. Dalling, C. H. Button, J. Clothier and G. F. Johnson (Hon. Sec.).

Homestead Meeting.—The meeting was held at the homestead of Mr. C E. Dalling. Members inspected the smithy, stables (which consist of 22 stalls), engine-house, cutter, and chaff-house, shearing-sheds, and other items of interest on the farm. Special notice was given a set of stump jump harrows manufactured on the farm, also a contrivance for smoking bacon, consisting of a 400gall. tank connected by a 4in. pipe with a tar drum in which the fire was lighted. A useful draught stallion, very quiet, which was used for general farm work as well as service, was noticed in the stables.

Port Broughton, September 26.

(Average annual rainfall, 14·44in.)

Present.—Messrs. T. Pattingale (chair), G. Pattingale, Routley, W Excell, P. Whittaker, A. J Fletcher, J. H. Fletcher (Hon. Sec.).

Fallowing.—In a paper on this subject, Mr. Excell said he preferred a good strong plough, well set, and not strained for fallowing. If the weeds were not too strong, a skim implement could be used. The land should be worked to a depth of at least 3½in. before the end of August, and within two or three weeks the harrows should be put over it, unless it were wet. It should then be cross-harrowed, and worked about the middle of September; the cultivator being used in preference to the skim plough, as it left the surface rougher. Straw and rubbish were better ploughed in than burnt. The land should lie out for two years before being fallowed. Mr. Allchurch (a visitor) said the great advantage of burying straw was that it tended to prevent drift. He practised deep ploughing, and his neighbor ploughed shallow; in both instances the crops were good. If they could stir the ground to a good depth without causing it to drift it would be of considerable benefit. Three and a half inches was the best depth for ploughing locally. Mr. G. Pattingale thought it better to plough to a depth of 6in. or 7in. on the flats; 3½in. was sufficient in the hills. Regular ploughing to the same depth caused a hard pan to form. The land should be cross-harrowed immediately after ploughing, the stubble being turned under. Mr. Goodridge (Pine Forest) mentioned the case of a farmer who fallowed to a depth of 1in., and worked the land well in September, and secured very good crops. The Chairman recommended harrowing immediately after ploughing. Where there was not too much rubbish the cultivator was more satisfactory than the plough. Members generally agreed that it was best to work the land east and west, and where weeds were not too numerous, the cultivator was the most suitable implement.

Port Broughton, October 10.

(Average annual rainfall, 14·44in.)

Present.—Messrs. T. Pattingale (chair), P. Whittaker, G. Pattingale, Donnelly, Hill, C. Routley, A. J. Fletcher, D. Allchurch, J. H. Fletcher (Hon. Sec.), and one visitor.

Fallowing.—The Hon. Secretary had made a comparison of the crops on land ploughed in March, 1912, July, September, and March, 1913. The first two were sown with Gluyas, and the latter with Gluyas and King's White, 90lbs. of super. per acre being applied. On the autumn and winter ploughed fallow the crops were about equal and very good; that ploughed in the spring would only yield about two-thirds the return of the two mentioned, whilst the land broken up just before seeding would yield only about half. He had come to the conclusion, therefore, that the area left for winter fallowing should be only as much as could be undertaken comfortably, the rest being done in the autumn. Autumn fallowing destroyed the weeds much more effectively than spring or later breaking up. Mr. G. Pattingale stated that Professor Perkins had said that this practice could only be continued for a while. Green manuring would be necessary to maintain the full fertilising and mechanical conditions. One did not allow weeds to grow on the fallow, consequently there was no loss of moisture in this direction. He made a practice of working his land deep in the wet years and shallow in the dry. If, in the latter case, it were worked too deeply, the seed would probably be put in too deep, and possibly a considerable amount of it would malt if the seeding rains were unfavorable. Mr. Donnelly said bacteria were more active in fallow land, consequently it was more fertile. These required a certain amount of moisture to enable them to work freely. When scrub was burned the bacterial action was facilitated and good crops resulted.

Veldt Grass.—Mr. Hill mentioned that a crop of this grass had matured ready to cut for hay seven or eight weeks after the seed was sown. It was very drought resistant, but susceptible to frosts. It needed to be sown annually.

Port Pirie, September 6.

(Average annual rainfall, 13·21in.)

Present.—Messrs. J. Greig (chair), W. Munday, T. Johns, F. Johns, D. L. McEwin, W. R. Wright, and H. M. Lawrie (Hon. Sec.).

Afforestation and Sand Drift.—Mr. W. Munday read a paper. The disastrous effects of drift were, in a large measure, due to the destruction of timber on vast areas of mallee lands, he said. At the present time thousands of acres of promising wheat crops were being covered with drifting sand. Bare fallowing and the practice of burning stubbles was also, in a large measure, responsible for this drifting. The denuding of large areas of timber, he contended, was affecting the climate and rainfall. The problem was a serious one, but was not insurmountable. Continuing, he said—"The State may fairly be asked to assist by inaugurating a vigorous policy of afforestation on Crown lands suitable for the purpose and repurchasing land in settled districts where available, and the locality, soil, and rainfall are of a character to promote the growth of timber suitable for commercial and general purposes. Much might be done if owners of land combined in the planting of trees suitable for shelter purposes along the boundaries of their respective properties, and the division of the various paddocks and corners Also portions of stony or otherwise waste land may be planted with advantage to stock and crops, and I am satisfied will more than compensate for the space taken up. In selecting trees suitable for shelter we must be guided by the character of the soil, locality, rainfall, and general conditions. Amongst the various kinds that may be found suitable, I have found the pepper tree to be one of the easiest and quickest to grow on my farm, and for shelter purposes it is hard to beat. I recognise, however, that it has no value for fencing or general purposes. The sugar gum, while more hard to establish, has the advantage of being useful for many purposes, but unless planted in congenial soil does not grow so rapidly as the pepper tree. Also upon soil suitable the pine is, perhaps, one of the most useful and valuable of our native timbers, giving splendid shade and shelter to stock. There are various kinds of shrubs suitable for hedges, the boxthorn being a rapid grower and fairly easy to establish, but harbors vermin, sparrows, &c. The Government should make it compulsory for every owner of land throughout the State to conserve or plant sufficient timber to meet this need. Help, in the shape of bonuses, towards this end might be given. I feel sure, with the hearty co-operation of the State and the landowners generally, a vigorous policy of tree-planting carried out on these lines will, in the near future, bring about a vast improvement in the direction of preventing the present havoc and loss through deforestation, and will also tend to bring about more favorable climatic conditions in the shape of increased rainfall and less aridity." The writer also thought that the future covenant to purchase land, issued by the Government, should include the reservation of a certain portion of the natural timber or the planting of trees. Mr. McEwin said narrow breakwinds were of little use, as the wind swept along between the breaks, causing the sand to bury fences and bushes. Stubble ploughed in on sandy land tended to bind it together. Mr. Eagle had planted sorghum on sand drifts and found that it grew well and prevented the drift. He advised leaving as much rubbish as possible on the land and not working it down too fine.

Redhill. October 14.

(Average annual rainfall, 16·79in.)

PRESENT.—Messrs. W. Pengilly (chair), D. Steele, F. Wheaton, Kelly, Stone, McAvaney, Potts, Treloar, Lines, Jackson, Larcombe, E. and B. Steele, A. and R. Dick, W. Hayes (Hon. Sec.), and four visitors.

HOMESTEAD MEETING.—The meeting was held at the homestead of Mr. D. Steele. The stables, which were well designed and drained, and the crops were inspected. Members were particularly interested in a seed-grading machine which did good work

DISEASES OF WHEAT.—Mr. J. J. Kelly read a paper on this subject. When the spores of the smut or bunt came in contact with the wheat grain and adhered to it after sowing, he said, they germinated and grew with it, the bunt balls, consisting of spores of the fungus, taking the place of the grain. The spores only germinated when supplied with a sufficiency of moisture, and in the event of their not coming in contact with a young wheat plant on germination they died. Dry-sown wheat was not so likely to be attacked as wet sown ; and some varieties were more susceptible to the disease than others. Oats and barley were affected with loose smut. Bluestone was the best preventive. The grain should be floor pickled a month before sowing and allowed to dry before being rebagged. The cask method was unsatisfactory, as the grain in the centre of the bag was not reached by the pickle. When black rust or flag smut was troublesome it was advisable to work the land at least once in a wet state. Too much rubbish should not be ploughed in. It was always advisable to include some rust-resisting wheat in the sowing. In his opinion takeall was the outcome of successive cropping, too deep ploughing, with insufficient after cultivation, and working the land in a dry state. He advised burning the stubble and keeping the fallows clean of weeds. Rubbish should not be ploughed in. Affected areas should be sown to oats, a suitable rotation being wheat, oats, fallow, etc." Mr. F. A. Wheaton said feeding off crops was a good means of checking takeall. Thorough cultivation was also advisable. Mr. J. A. McAvaney advised sowing oats.

WOOL-CLASSING.—On October 17th the Wool Instructor (Mr. H. Jackson) gave a demonstration of wool-classing before a number of members and visitors.

Spalding, October 17.

(Average annual rainfall, 20·25 in.)

PRESENT.—Messrs. E. E. Gill (chair), P. A. Gill, Walsh, Kelly, Heithersay, Gale, Neill, Marron, C. W. Smith, McAskill, Thorn, Sommerville. Richardson, Wilson, D. A. Campbell (Hon. Sec.), and 22 visitors.

RED WORMS AND HOVEN.—Mr. Rundle gave an address on veterinary matters, in the course of which he spoke on the ravages of the red worm in the district. He advised farmers who were obliged to use surface water for stock, to purify same with sulphate of copper, 10lbs. to 40,000galls. of water. Drinking troughs should be scoured once a week. For a horse that had got at wheat he advised giving a dose of 8ozs. of Epsom salt, 4ozs. of bicarbonate soda, 1 oz. ginger, and two hours after allowing the animal as much water as he cared to drink. Cattle suffering from hoven should have a broom handle placed across the mouth to hold it open, this being secured by straps to the horns on either side. In most cases this was sufficient to give relief.

Whyte-Yarcowie, October 13.

(Average annual rainfall, 13·91in.)

PRESENT.—Messrs. G. F. Jenkins (chair), Robinson, McGregor, J. R., G. W., and W. Mudge, Wittwer, E. F. Pearce, Van Senden, E. J. Pearce (Hon. Sec.), and eight visitors.

WOOL-CLASSING.—The meeting was held at the residence of Mr. E. M. Jenkins, and a demonstration of wool-classing was given by the Wool Instructor of the School of Mines (Mr. H. Jackson).

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Clare, September 12.

(Average annual rainfall, 24·30in.)

PRESENT.—Messrs. J. Scales (acting-chairman), I. C. Radford, H. Hanna, F. J. Gertau, F. Knappstein, C. Radford, W. J. Maynard, M. L. Nolan, A. Hill, F. G. Hicks, C. T. Jarman, F. Pink, R. Hunter, C. Pink, and P. H. Knappstein (Hon. Sec).

FRUIT-GROWING.—Mr. F. J. Gertau read a paper, in which he recommended for planting in this district a few acres of currants, prunes, and pears for drying and export, export apples, peaches, apricots, and sultanas. This would provide employment in the orchard all the year round; and in the event of one crop failing, a total failure of income would not result. There was also a greater likelihood of a demand arising in England for such dried fruits as pears, prunes, peaches, and apricots. Peaches, apricots, and sultanas should be put in on the red limestone ground, prunes on the flats in deep black soil, and currants on slightly higher ground where they would escape frosts. The land should be fallowed and subsoiled if possible. Good trees and vines for planting were essential. Mr. Hicks did not think it would pay to grow peaches in this district. Mr. C. Radford said that peaches grown in suitable soil were very payable, and gave an instance of an orchardist in the district who netted £44 from half an acre of these trees. Mr. Hunter said peaches were payable. Prunes should do well here on the rich flats. Currants were pretty well exhausted, but had not reached the limit yet, owing to the increasing consumption of the last few years. It was not advisable to subsoil all classes of soil as mentioned in the paper, as in some cases the clay was close to the surface, and it would not do to turn that up to the top. Mr Jarman advised anyone thinking of planting to fence the land well with wire netting to keep out hares and rabbits, as they would destroy the young trees. He was unfortunate in planting early peaches. He preferred apricots, as they came in earlier than currants and the grower had time to get them dried and finished with before the busy season came on. Prunes might be overdone. He believed in ploughing the soil as deep as possible, and then following along in the same furrow with a plough that had the mouldboard taken off, which did not turn the clay up to the surface, but only just loosened it. Mr. I. C. Radford had apricot trees which were 20 years old, and from the time they came into bearing at five years old up to the present he had only had one failure with them. They were planted on limestone soil with an easterly aspect. The amount of prunes consumed was enormous, and he did not think they could be overdone, so growers need not be afraid to plant them Jam made from dried apricots was preferable, he thought, to jam made from the fresh fruit. Mr. P. H. Knappstein congratulated the writer on his paper, and agreed with his views in the main. He thought that apples did not pay to grow. Duchess pears, wine grapes, and sultanas were the most profitable varieties at the present time, as well as a few good prunes on good deep and damp alluvial soil. There was a great future for wine grapes. Members considered that it was time to start grafting when the buds were just starting to burst. Mr. P. H. Knappstein said it was a difficult matter for a man who canned his own fruit only to find a market for the product. If a co-operative cider factory were started in this district it would prove a paying concern, as there was a ready market for cider.

Freeling, September 29.

(Average annual rainfall, 17·85in.)

PRESENT.—Messrs. A. J. Kuhlman, G. T. Elix, C. A. Schultz, F. W. Schuster, E. Savage, J. H. Gramp, E. Morris, A. Elix, M. Shanahan, J. E. Veldner, H. Neindorf, H. Koch, C. H. Mattiske, F. W. Schafer, C. W. H. Koch, J. Wegner, E. C. Leske, A Heinrich (Hon. Sec.), and two visitors.

SCIENTIFIC FARMING.—In a paper under the title "What is Scientific Farming," Mr. G. Boerke read an interesting paper, in which he said—"Measurement is the basis of all the sciences, and therefore of scientific farming as well. Consider the case of two dairy farmers, for example. The first keeps a number of cows, cares for them to the best of his ability, and sells his milk to the creamery, cheese factory, or to the city. The second keeps the same number of cows, cares for them equally well and sells his milk in the same way, but in addition he measures the milk given by each cow, by weighing it at each milking. He measures the food given and the labor used, so that at the end of the season he knows exactly the profit from each cow, or whether some of them have been a loss to him. He knows which cows are yielding a profit, and to what extent; also which cows, if any, are living at his expense. We shall all agree that the second farmer is the more scientific of the two. Again, science teaches that warmth in the animal economy is produced and maintained at the expense of food consumption. Every practical farmer knows that keeping cows warm by rugging them means a saving of food and an increase in the production of milk. This has been proved by Mr. O'Callaghan, Dairy Expert, New South Wales. He states in a test taken during an eight weeks' spell of wet and frosty weather unrugged cows fell off 31 per cent. in their milk, while the cows which were rugged at night only fell off 18 per cent. in their milk; also, that if cows were rugged day and night through bleak cold weather there would only be a loss of 5 per cent., or, compared with cows not rugged, a gain of 26 per cent. In growing field crops the scientific farmer will measure the size of each field, the amount of grain planted, the amount of labor expended on each crop, and at the end of the season the amount of the harvest in grain and straw Thus he is in a position to know exactly the profit obtained from each crop. Measurement then is the first step in scientific farming. The second is to keep an orderly record in which the measurements for each cow and each field, &c., are entered when made. These records give the scientific farmer an exact knowledge of the results he is obtaining from his farm, and this exact knowledge is the starting point in the search for improvement. In looking for improved methods the scientific farmer compares his own methods and results with those of successful farmers in his locality and in all parts of the country. He studies the methods used and the results obtained along his line by the experts of the Government and of the Agricultural Colleges. He tries to learn *why* these methods give the results they do, so that he may be in a position to judge of their applicability to his own case. If, as a result of this study, he decides to try certain new methods to see if they will produce improved results, he does not apply them to his whole farm, or whole herd, but to one field or to one or two cows; that is, he makes an experiment, and he is careful to measure every factor in the experiment that has a bearing on the result. If the experiment shows that the new method gives increased results he applies it to his whole farm or herd, keeping up his measuring and recording of measurements to see what the results are on a large scale. These new measurements are then studied for further improvement. The value of experimental work is being recognised more and more by leading agriculturists. Experiments that require a special knowledge of chemistry or biology cannot easily be carried out by ordinary farmers, but there are many experiments that are well within the power of every practical farmer, such as seed tests, graded or otherwise; quantity of seed, small or cracked grain and specially selected grain; sowing catch crops; which is the most profitable sheep for farm conditions; depth of sowing; pickling wheat, with bluestone, fungusine, formalin, or hot water treatment; manure tests, as to quantity and variety on experimental manure plots. It is so easy to waste money on chemical manures that the first thing necessary is to think about the matter. To put pounds worth of fertilisers into the land should not be the objective, but to spend the money to the very best and most profitable advantage. There is plenty of literature on the subject—enough to confuse one, in fact. Every firm of manure merchants supplies full directions for using its particular brand of manure, and every State Agricultural Department and experimental station issues numerous reports on the subject. The more one reads the more complex the problem may well appear to be. After mastering the elementary fact that no plant life is possible unless the soil is sufficiently rich in nitrogen, phosphoric acid, and potash, the inquirer is confronted with the difficulty that the amounts of these requirements and the proportion they should bear to each other vary as greatly as do the soils in different localities, and the kind of crops which are grown in them. Multiply the number of classes of soil by the number of different crops grown and the total will represent the number of different manure mixtures that it is possible to use. One may be excused for fearing that he will never hit upon the right thing; and yet, in the absence of a sufficient supply of natural manures, the constituents lacking must be supplied by means of chemicals. No treatise on the subject can inform one *exactly* what kind and what quantity of fertiliser the soil requires—this must be found out by experiment. The first axiom in manuring is that we must return to the soil an equivalent for that which we take out of it; and the chemists can help us here, for analysis will give the exact quantities of the different elements which a crop contains. The basis of the experiments must be the use of a complete manure, that is, one containing the same or greater amounts of nitrogen, phosphoric acid, and potash which a ton of hay or wheat, for instance, will remove from a given area of land. Let the experimental manure plots be at least half an acre in size. On plot 1 use a complete manure, *i.e.*, one that contains nitrogen, phosphoric acid, and potash. This plot may give good results. On plot 2 omit nitrogen. If equally good results are obtained as from plot 1 it will show that money spent on nitrogenous manures is therefore thrown away. On plot 3 omit phosphoric acid, but use nitrogen. On plot 4 omit the potash only. So that there shall be no mistake leave an unmanured plot to separate each of the others. The result of these experiments, if properly measured and recorded, will tell the farmer more than a ton of literature would. This one series of plots will not give all the information required. In another set of experiments the amount of manure used should be increased to see whether it will pay to put more on. In some cases there is a certain maximum requirement, and anything above that produces no increased results; it is waste in the case of nitrogen, but phosphoric acid will remain in the soil as a permanent enrichment. The experiments may further be varied by using nitrate of soda or sulphate of ammonia to supply nitrogen, Thomas' phosphate or superphosphate to supply phosphoric acid, and sulphate of potash or muriate of potash to supply the required potash, and by applying them to the soil at different times of the season.

Friedrichswalde, September 13.

(Average annual rainfall, 18in. to 19in.)

PRESENT.—Messrs. R. Marlowe (chair), F. and J. Heintze, G. Grope, F. W. Duldig, P. Goodfellow, F. W Schutz, T. Pfitzner, R. Zema, J. B. Coombe, (Hon Sec.) and five visitors.

FERTILISERS.—In a paper on this subject the Hon. Secretary said that before fertilisers were popularly used the average wheat yield of South Australia varied from 4bush. to 7bush. per acre, whilst at the present time it was between 9bush. and 12bush. Better methods of cultivation and good seasons had contributed largely to this increase, but the use of fertilisers was mainly responsible for it. Analyses had shown that South Australian soils were deficient in nitrogen, potassium, and calcium to a small extent, but to a far greater degree lacking in phosphorous. A complete manure would return these essentials to plant growth to the soil. Wheat manure, as it was called, seemed to meet the case. It contained a large percentage of soluble phosphate, small quantities of nitrogen, potassium ,and calcium. An increased yield of 1bush. per acre would pay for the extra cost of this manure over superphosphate. The correct quantity to apply could only be determined by experiment. Experiments had been conducted with the idea of determining the value of nitrate of soda and sulphate of potash as manurial dressings, but as these two fertilisers were so expensive a considerable increase in yield was necessary to recoup the outlay. Another disadvantage was that any residue not utilised by the growing crop was lost. With superphosphate this was not the case, as the phosphate became incorporated in the soil as acid soluble. If the farmer, by applying 37lbs. extra of super. per acre, increased his yield by only half a bushel it would pay him to do so. The scope for experimental work in the matter of the quantities of manure to apply, the varieties of seeds to sow, and the quantities to sow was exceedingly great.

Gawler River, October 10.

(Average annual rainfall, 17in. to 18in.)

PRESENT.—Messrs. F. Bray (chair), J. Hillier, G. Higgins, P. T. Hill, C. Leak, W. Richter, E. Winckel, B. F. Hillier (Hon. Sec.), and three visitors.

MARKETING WHEAT.—Mr. E. H. Coombe gave a very interesting and instructive address on the marketing and handling of wheat. He had acted as Chairman of the Wheat Commission, and gave a lengthy account of their work and findings. On account of less competition in this State prices were lower than they should be. There should be some system of storage so that farmers could command their wheat at any time, because if stored with the buyer they were reducing competition. He described the silo scheme of Mr. F. H. Webb, and advised its adoption. These silos could be erected at the Outer Harbor and at places inland by the Government. The farmer, on sending his wheat there, would receive a certificate and could trade with it wherever he liked. This system of storage would greatly reduce the present waste. The wheat could be graded and could be exported either in bags or bulk. The interest on the capital cost would be nothing compared with the advantages derived.

Nantawarra, October 9.

(Average annual rainfall, 15·90in.)

PRESENT.—Messrs. T. Dixon (chair), W. Smith, F. J. Sutton, A. F. Herbert, J H. Nicholls, W. Greenshields, J. Sinclair, and G. L. Tucker (Hon Sec.).

BREEDING AND FEEDING FARM STOCK.—Mr. W. Greenshields read a paper in which he said it would pay every farmer who bred from six or more mares to keep a stallion. When a travelling horse was availed of there was not only the cost of service, but during the season seven or eight days' time was wasted in connection with the service. The animal purchased should be well-bred. Continuing, the paper read—"I suggest a short, nuggety animal, well-ribbed, with plenty of muscle, good flat bones, a fair quantity of hair, and a small head if possible, as a horse with a small head generally takes the eye. It would not pay farmers to buy mares especially for breeding. The medium draught is the most suitable for farmwork, requiring less food than the heavy, and is generally found in the lead. A great deal depends on their treatment when they are foals. When weaning foals it is advisable to shut them up in a place of which they will not be constantly trying to get out. Feed them on good rich food. Dampen the chaff and add bran and pollard; feed often, but only in small quantities so that it will not get sour. If a foal is well looked after he will be ready to break in when two years of age, but if it is allowed to become poor at the start it will most likely have to be fed until three years of age before being fit to be broken in, and even then it will not make the horse it otherwise would. We can make our haystacks last a great deal longer if we use more corn. I favor oats, as they do not cause boils, but give the animals strength and plenty of life. It is a good plan to have a big stable yard with a stack of straw in it. When a horse wants to rub himself he will do so on the straw. He is thus able to rub off the sweat and keep himself much cleaner, and consequently save time in grooming. Boxes containing salt should be kept about the yard so that the horses may easily help themselves when they need it." Mr. A. F. Herbert agreed with the writer of the paper, that it paid to keep a stallion. He advocated getting a young one and making a worker of him. While medium draught horses did as much work as the heavier type it was better to breed the heavy class, as their market value was greater. Mr. Sutton said the choice of a stallion was ruled by the condition of the buyer's pocket. He favored a nuggety horse, but concurred with Mr. Herbert that the selling value of the heavy draught was greater than that of the medium. He advised care when feeding grain to farm stock. Mr. Sleep considered six mares too small a number for which to keep a stallion. He agreed with the paper in regard to stamp of horse for farm purposes. It did not pay farmers to breed for market. Mr. Smith thought attention should be paid to the class ot mare bred from. The breeding of a right class would prove profitable to farmers. When a stallion was kept the mares could be caught in season. Mr. J. H. Nicholls thought it would not pay to keep a stallion for only six mares. If a stallion were kept it should be a good one, and the farmer did not care to incur the risk of injuring a valuable stallion by working it. Little time was saved in service through a farmer owning the stallion. He agreed with the paper in regard to the type of horse for general farm use It would be better to put a straw stack in the paddock for the horses to rub on; thus doing away with the attendant litter. In reply, Mr. Greenshields did not consider having to keep a stallion in his stall a disadvantage. There was always a horse ready to hand when wanted, and consequently the stallion did more work than any other horse on the farm.

Riverton, July 26.

(Average annual rainfall, 20·48in.)

PRESENT.—Messrs J. P. Schultz (chair), W. Legoe, R. H. Cooper, R. Wilkinson, T. Camac, J. W. Kelly, W. B. Davis, W. Stacey, F. Phillips, A. Hannaford, and E. A. Gray (Hon. Sec.).

ODDS AND ENDS ON THE FARM.—Mr. A. Hannaford read a paper under this heading, in which he urged the members to prevent waste on the farm. Scraps of iron, &c., which were frequently thrown about could be utilised for bolts, repairing implements, &c. Regular inspection of fences was advisable, and considerable time and trouble would be saved by putting in serviceable gates in place of makeshifts. Attention should be paid to horses' mouths, particularly to see that they were not suffering from the effects of grass seeds, and that their teeth were in good condition. Harness should be hung up and oiled periodically. The use of wax and thread frequently made a much better job of small repairs than tying with wire or string. Implements should be kept in good repair, the woodwork being painted to protect it from the weather. Cows, pigs, and poultry, to supply the needs of the household, would be found valuable.

Salisbury, September 9.

(Average annual rainfall, 18·57in.)

PRESENT.—Messrs. Moss (chair), Tate, Frost, Bussenschutt, James, Hooper, Bagster, Short, Ray, Fleet, Illmann, Eyre, Jenkins, and seven visitors.

THE AGRICULTURAL BUREAU.—A paper on "The Agricultural Bureau, and a few of the reasons why farmers should support it," was contributed by Mr. S. Eyre, of the Georgetown Branch. The writer was quite satisfied that it would pay every farmer to become an active member of this organization. Practical farming was becoming more and more a science, and the man who was contented to jog along in the old narrow way was soon left behind by his progressive neighbour. The Bureau was to the farmer what the public school system was to the child. The idea of Branches possessing a bound volume of the *Journal of Agriculture* was a good one. The spirit of emulation engendered by the holding of homestead meetings had much in its favor. A great deal of the success of a Branch rested with the Hon. Secretary and the Chairman. Regularity of attendance was essential. Closer attention to the rules of debate during discussions would in some cases be an improvement. General conversation during discussions should be checked.

Salisbury, October 2.

(Average annual rainfall, 18·57in.)

PRESENT.—Messrs. Moss (chair), McNicol, E. V. and H. J Harvey, Tate, Frost, Neal, Judd, Hooper, Bagster, Baylis, Ray, Fleet, and Wilkinson.

NITROGENOUS MANURES.—A paper on this subject was read by Mr. Crawford. The writer of the paper emphasized the importance of the addition of nitrogen in some form to land carrying cereal crops. If the soil were deficient in any one of the essential elements of plant food, he said, the crop would be affected, and a superabundance of other plant foods would in no way compensate for the absence of this one. The relative values of different forms of nitrogenous manures were discussed. Members agreed that it was advisable to thoroughly test the effect of applications of nitrogenous fertilisers. [A reference to page 1097 of the May, 1913, issue will show the result of eight years' tests in this connection, conducted by Mr. F. Coleman, of Saddleworth.]

Stockport, October 10.

(Average annual rainfall, 15·89in.)

PRESENT.—Messrs. D. G Stribling (chair), F. Watts, T. Megaw, E. Weckert, C. W. Cant, T, Howard, S. Nairn, G. Thomas, C. Perry, R. Whitelaw, and J. Murray (Hon. Sec.).

TWENTY-FIRST ANNIVERSARY.—The Hon. Secretary reported that a very successful gathering had taken place on the 19th August in connection with the twenty-first anniversary of the Branch. Addresses were delivered by Messrs. Gordon, Coleman, and Kelly, of Saddleworth Branch; N. S Kelly and J. Nairn, of Mallala; and in the evening the Minister of Agriculture (Hon. T. Pascoe, M.L.C.) and Mr. G. R. Laffer (Chairman of the Advisory Board).

COMPARISON OF SEASONS.—It was decided that a record of the results of the harvest during successive years on a particular section in the district should be kept in the minute-book of the Branch

Two Wells, September 16.

(Average annual rainfall, 16·36in.)

PRESENT.—Messrs. E. H. Green, J. W Hart, J. Williams, R. Kenner, H. W. Kenner, A. Pratt, H Goss (Hon. Sec.), and one visitor.

FARM HORSES.—In a paper on this subject, Mr. H W. Kenner said the best horse for the farm was the thick-set, medium draught. This was easily kept in condition, was a good mover, capable of drawing heavy loads. The stallion selected for breeding should be active and sound and have the Government certificate. The Suffolk Punch was a good horse to mate with a heavy mare. Mares of this breed should not be used for breeding until they were 4 years old. An animal that kept fat when in foal should be worked to within a few days of the time of foaling. After foaling the animals should be fed from a low manger, in order that the foal might be encouraged to feed. It should be given plenty, and allowed about the stable with the other horses. The first item of its education should be mouthing. Light work should be given at the age of 2½ years. Stables should be of stone and iron, and cleaned out every morning. Grooming should be carried out thoroughly, and when an animal was suffering from sore shoulders it was advisable to cut the collar and so ease the trouble. A galvanized iron trough should be provided in the stable yard, the horses being watered before and after being stabled and fed. All chaff was the best feed, unless good short feeding hay could be grown. Salt should be kept in the mangers, especially if Barossa water were used. Mr. Pratt thought it unwise to have a trough in the stable yard.

Watervale, September 15.

(Average annual rainfall, 27·17in.)

PRESENT.—Messrs. E. E. Sobels (chair), W. Smith, F. Burgess, A. Burgess, F. L. Burgess, A. Davis, F. Hunter, O. Dunstan, G. Hunter, J. Scovell, J. Broadbent, W. Tavender, C. W. Grace, F. Hamp, J. R. Hamp (Hon. Sec.), and one visitor.

PEACH TREES SHEDDING BUDS.—Mr O. Ward, in a paper on this subject, said that Briggs May and Hales Early varieties of peaches, which were two of the first to be ready for market, frequently gave a large show of buds. The majority of these, however, failed to hold as the season advanced, with the result that should the trees have been pruned n the ordinary way the crop would be very light. He found these varieties profitable to grow, but made a rule of pruning them just when they were coming into bloom. He was thus enabled to form an idea of the crop that would be carried, and the pruning could be adjusted to the conditions. If, as occasionally happened, the trees came through the late winter without shedding many of their fruit buds, the crop could be easily thinned. In discussing the subject, Mr. F. Burgess preferred to prune the Briggs May varieties early, as he thought the peaches then filled out better. Mr. Holder believed in pruning the peach trees just as the buds were about to burst. One was then able to see which wood it was best to leave. Mr. Hunter was troubled with sparrows picking the peach buds when the trees were blooming.

Watervale, October 13.

(Average annual rainfall, 27·17in.)

PRESENT.—Messrs. E. E. Sobels (chair), J L. Broadbent, O. Ward, J. Scovell, W. Tavender, A. Burgess, F. L. Burgess, W. Baker, A. Davis, and J. R. Hamp (Hon. Sec.).

STRAWBERRIES.—In reply to a question, Mr. Broadbent advised allowing strawberries to fruit during the first year, runners for fresh plants should then be planted. The best time for planting was in the winter months, the plants being put in rows and left until they grew into a mass. They should then be rooted out and put in again. A heavy manuring was advisable. Mr. Burgess mentioned that when allowed to grow in a mass, as recommended, there was a difficulty in keeping the strawberries free of weeds,

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Maitland, October 4.

(Average annual rainfall, 20·08in.)

Present.—Messrs. Smith (chair), Bawden, Bentley, Darling, Hill, E. G. and A. Jarrett, Tossell, Wundersitz, Pitcher (Hon. Sec.)

Water Conservation.—Mr. Bawden read a paper on this subject, in which he stated that the present season had shown many farmers the folly of depending solely on dams and reservoirs for water for stock. He advised the construction of underground cement tanks, about 20ft. square and 12ft. deep with iron roofs, on different parts of the farm. In his opinion every farmer should construct enough tanks to provide for the whole farm for at least six months. These should be built to about 3ft. above the surface of the ground, and cement troughs should be placed at the sides. A small windmill might be purchased and transferred from tank to tank as each was emptied. The farmers who constructed four of these tanks on every 500 acres would never, in the driest of seasons, be without sufficient water for the stock. They would hold about 30,000galls. each, and cost about £80 Mr. Hill agreed that tanks should be kept full, as a reserve supply when the rainfall was light and scanty. Mr. Jarrett advocated large dams where there was a sufficient catchment.

Fodder Crops.—Mr. Hill tabled a sample of well-grown barley sown in June, and also a sample of self-sown barley and native clover, a good mixture for ensilage, and a particularly well-grown sample of ordinary field peas sown on the 25th July. It was grown on land that produced a good crop of oats last year. He advocated growing peas and feeding them off with sheep until the natural herbage obtained a start and then ploughing in the peas for the benefit of the land. There was too much bare fallow in this district. Mr. Tossell tried peas on fallow last year, but they were unsatisfactory. Sheep would not touch them. The wheat crop was not so good on the land where the peas were grown last year. He attributed that to the peas taking most of the moisture out of the land. Mr. Jarrett, who had been travelling in the South-East, had noticed that peas were grown very extensively near Bordertown. Mr. Hill, in reply, said every farmer should experiment with various fodders on fallow land, and that the land the fodder was grown on should be fallowed again the following year.

WESTERN DISTRICT.

Butler, October 6.

(Average annual rainfall, 16·61in.)

Present.—Messrs. R. W. Phillis (chair), F. Durstan, A. J. Hughes, J. Owen, G. J Parker, C. F. Jericho, D. B. Butler, G. Unvoius, J. G. S. Morgan, S. M. Bawden, J. C. Humphrys, G. Young (Hon Sec.), and four visitors.

House-Building —In an address on this subject Mr. Jericho demonstrated by means of a blackboard the best methods of obtaining levels and of squaring a building. All timber should be cut to the correct measure before the erection was commenced. He mentioned a simple method of ascertaining whether a building was being erected on the square, *i.e.*, 8ft. of the length should be measured from a corner post and 6ft. of the width from the same post. If the shortest distance between these points were 10ft. the building would be found to be square. He would put 4in x 2in. battens on the edge of the roof to strengthen it against sagging, and would give it a pitch of not less than 1in. in 2ft., so the dew could run off and the iron would not rust. The guttering should have a pitch of 6in. in 50ft. ; 24-gauge iron would be found the cheapest in the long run, and it would strengthen the building considerably. Members considered this information very useful, especially to one or two members who were about to erect buildings.

Coorabie, September 18.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. C. T. Giles (chair), W. Cousins, V. R. Weston, F. Woodforde, C. A. Fox, B. Giles, A. Riddle, G. Riddle, W. G. Wheadon, F. M. Underwood, R. Muegge, G. Cabri, H. V. Hobbs (Hon. Sec.), and five visitors,

Farmers' Mistakes.—One of the members read a few notes on this subject, which included putting up makeshift fences, placing wire netting on the fence too far into the ground, want of care in the selection of clean seed wheat, and failure to erect substantial galvanized iron sheds for implements, &c. Several members agreed that it was necessary to put up substantial fences from the first, and emphasised the importance of netting the fences in this district, whether rabbits appeared numerous or not. Several other members then recounted operations they had conducted on their farms, which in the light of experience they had found to be mistakes. They were as follows:—The insufficient working of land and not waiting for rain to fall to re-plough grassy land before seeding. Land sown dry had yielded 6bush. per acre, while similar land alongside worked after rain had yielded 15bush. per acre. Seeding new black grass land, which should first have had the benefit of one year as fallow. Attempting to crop too much land during the first few years. Fallowing, with more thorough working of the land, water conservation, and other matters should receive early attention on a new scrub farm, instead of the farmer merely struggling after a big average of crop. Cultivating scrub land the second year instead of ploughing it. Whether ploughed the first year or not scrub land should be ploughed the second year; otherwise fire bush and other weeds gained a very strong hold. Reaping a dirty crop and then going straight on to new or clean land with the machine. If the crop on new land could not be harvested first, then too much care could not be taken in cleaning out the machines. Continuing seeding into the month of June. Seeding in this district should be finished by the end of May. A week's seeding at the end of April is better than a week early in June. Not cutting the mallee shoots on new scrub land prior to stripping the crop. All new land should be gone over and the shoots cut before harvest. Failure to construct underground tanks for the conservation of water, and consequently having to cart water. The relating of these mistakes gave rise to an interesting discussion.

Elbow Hill, October 11.

(Average annual rainfall, 11in. to 12in.)

Present.—Messrs. Cooper (chair), A. Chilman, H. and S. Wheeler, S. V. Wake, C. E. Jacobs, J. Spence, A. Ramsey, J. F Brooks, G. W.Bradley, F. Freeth, G. F. Wake (Hon. Sec.), and three visitors.

Harvesters v. Strippers.—The relative advantages of the use of harvesters or strippers were discussed by members. Mr. A. Chilman said that the harvester could be started in the crop on an average three hours earlier than the stripper, and could be worked later at night. The wheat was stripped and cleaned in the one operation, and, if so desired, the chaff could be saved by means of attaching a chaff-carrier to the machine. Mr. G. Wake quoted figures to show that the harvester was cheaper than the stripper to use. Also, more grain was lost by the stripper and winnower. Chaffed straw was more nutritious than wheaten chaff. The distribution of weed seeds was advantageous in that it enabled the land to carry more sheep. Mr. A. Ramsey said more grain was secured by the harvester, which he had frequently seen drawn by four horses. Mr. G. C. Dunn contributed a paper, in which he quoted figures to show that the harvester was a money and labor saving machine. Mr W. T Cooper thought the stripper would last much longer than the harvester, which was of very heavy draught, and scattered weed seeds over the land, in addition to wasting wheat. Cocky chaff was very useful in times of draught Mr. Wheeler thought the use of the stripper the cheaper method of harvesting. Mr. S. Wake concurred, and thought there was less wear and tear with these machines. Mr. C. E. Jacobs said that as wheat could be cleaned for 4d. per bag the use of the stripper was advisable.

Mitchell, October 4.

Present.—Messrs. A. E. Howell (chair), W. Sampson, S. Baker, D. Sampson, E. Dyke M. McCormack, J. P. and O. Green, G. Jericho, H. Voumard, D. Ness, G. Wright, R. Merchant, W. Ness, A. Ashman (Hon. Sec.), and five visitors.

Fallowing.—Messrs. E. Dyke and S. Baker read papers on this subject. The best time to fallow, it was contended, was as soon after seeding as possible. Care should be taken in the selection of the plough. If the team tired it was better to take a furrow off and do less than to pull the plough out slightly. The soil should be turned over and exposed to the air, all grass and rubbish being turned over at the same time. The depth of ploughing should be about 4in. The cultivator should be used after the plough, during

September, and after each rain. The land worked much better when wet. Sand that was liable to drift should be worked with discretion.

The writer of the other paper advised fallowing in July and August. In wetter seasons the work could be kept on until October. Very early fallow had a tendency to dry hard, and it should, therefore, be worked as soon as it began to set. All fallow should be lightly cultivated or harrowed with heavy harrows weighted with logs once during the spring, towards the latter end of October being the best time in the average season. The disc cultivator destroyed shoots. The greater part of the land in the district would be better if ploughed to a depth of 6in. ; some of it could be ploughed to even 9in. or 10in. with advantage. The disc plough was very useful where there were shoots and undergrowth to contend with.

Utera Plains, October 11.

(Average annual rainfall, 12.06in.)

PRESENT.—Messrs. Guidera (chair), Rule, Venning, J. and M. Abrook, G. Barber, G. Hornhardt, Gale, Stephens, W. Lee, sen., and J. A. Ramsey (Hon. Sec.).

CONSERVATION OF PLANT FOOD.—Mr. J. C. Norton read the following paper :—" In this and similar districts, where the soil is not particularly rich, it is necessary to husband the supply of available plant food in every possible way. Plants require some nine or 10 different substances from the soil, the chief being phosphoric acid, potash, and nitrogen. These must all be present in a form which is soluble in water, for the roots cannot directly absorb solid matter as food. The presence of humus is of great importance to plant growth, especially in light soils. Humus is formed by the decomposition of vegetable matter, and improves the soil in many ways. Being spongy in its nature it absorbs and retains moisture, and in so doing helps to keep the soil cool and moist in hot weather. It discourages the leaching of manures in sandy soils, and also acts as a cement, holding the particles together. It is the principal nitrogenous ingredient, and to its presence is largely due the fertility of new land. It is formed in uncultivated soils by the decay of the wild plants which have grown on them, and at present we are utilising this accumulated store in growing our crops. It must be our object to return as much of this humus to the soil after we have used it in growing our crop, in order to keep up the supply for succeeding crops. At present by burning our stubble we are destroying the humus, and all the nitrogen, which is contained in it. Of course on new mallee land for the first few years we must burn the stubble to kill the mallee stumps, but it is not advisable to continue this practice longer than is necessary, or we shall exhaust the soil. If we feed down the stubble and plough it in we return all the humus and nitrogenous matter to the soil, except that which has been taken away in the form of grain, wool, or meat. Different plants require different proportions of the various foods from the soil, and when the same kind of crop has been grown continuously on the land and harvested and taken away from it, the soil becomes poor in the chief substances which the particular plant requires as food, unless steps have been taken to replace them, so that land would in time become infertile for that crop Nevertheless it might still be very fertile for another kind of crop which requires other foods in greater proportion. Some plants by their own growth bring into the soil from outside sources materials which will act as fertilisers for other crops. Leguminous crops (*e.g.*, peas, lucerne, clover, &c.) secrete nitrogen, so that when they die and the roots decay they leave it in the ground in a form which is suitable for a food for succeeding crops. Up to the present very little has been done in this locality in the way of any system of rotation of crops, chiefly because the land has been comparatively recently cleared, and has had a good store of the necessary plant foods, but now that the land has grown a number of crops almost entirely of wheat we must look ahead to keep our land in good heart. It is not sufficient to continuously apply superphosphates only as the fertilizing agent, as that only supplies phosphoric acid, which, though the chief one, is not the only food required by cereals. By growing different crops in rotation we make nature supply most of the other foods required instead of supplying them in the form of artificial manures. The following are some advantages of growing crops in rotation, given by the late Mr. J. L. Thompson, late Travelling Instructor of Agriculture in N.S.W. :—It is more economical of manure ; it is more economical of food in the soil ; it allows of a better distribution of labor on the farm throughout the year ; a rotation of deep-rooted or air-feeding crops enriches the top soil for the benefit of shallow-rooted varieties to follow ; some crops are a good preparation for others, such as clover before wheat, &c. ; rotation checks the devastations of insects and fungi, by changing the locality of the crops which they affect ; a system of rotation changes the locality of livestock every year. The growing of forage crops for feeding off on the land and so converting them into marketable wool and meat is an important item in every system of rotation. At present lack of water is a great obstacle to successful stock raising here, but it must be overcome before we can obtain full value from our land. Before adopting any definite system of rotation we must begin by experimenting with various kinds of crops to find out which are the most suitable for this district, and which are the most beneficial for succeeding crops. This is where the Agricutural Bureau branches might show their utility, and make their meetings much more interesting, by organising among their members some original work like this. Various members could be appointed to experiment with certain crops, and then at the end of the season compare the results at the meetings."

Yadnarie, October 11.

(Average annual rainfall, 14.09 inches.)

PRESENT.—Messrs. F. W. Dreckow (chair), W. L. Brown, J. H. Kruger, G. H. Dreckow, E. C. Dreckow, E. C. Kruger, A. Spriggs, R. H. Parbs, B. B. Crosby, S. H. Pearce, J Kruger, P. Briess, A. A. Jericho (Hon. Sec.), and a number of visitors.

HANDLING WHEAT IN BULK.—In a paper on this subject Mr. R. H. Parbs said the general objection to the bulk handling of wheat was the cost of erecting sheds, and weighing machines, and altering the bodies of railway trucks. The money spent in the purchase of bags, however, more than counter-balanced this. These cost 7d. each, and were sold as wheat for 2½d., a direct loss of £20 on every 1,000 bags. A store capable of holding 60,000bush. could be put up for £800, and a weighing machine, with a capacity of 20 tons, would cost £100. With a weighing charge of 3d. per ton, and storage at 1d. per bushel, the cost of handling to the farmer of 60,000 bush. would be £272 10s. Bags to carry this quantity would cost £400, therefore bulk handling would result in a saving of £127 10s. He urged members to use every endeavour to forward the adoption of this system. Members were divided in opinion as to the wisdom of the proposed alteration.

Yallunda, September 13.

(Average annual rainfall, 18in. to 19in.)

PRESENT.—Messrs. F. Olsten (chair), R. B. Jenkins, G. Provis, P. V. Provis, W. and H. P. Cabot, S. C. Fairbrother, T. Allen, W. Winstanley, W. Forrest, G. Teagle, M. Hissey, J. S. Perry, A. G. Price (Hon. Sec.), and two visitors.

MANURES.—Mr. R. B. Jenkins was of opinion that bonedust was the most suitable manure for use in this district. Mr. G. Provis had received good results from fairly heavy dressings of lime applied two or three weeks before seeding. Mr. G. Teagle strongly advocated green manuring with field peas. Messrs. Fairbrother and H. T. Cabot advocated heavier dressings of super. both to wheat crops and pastures.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Berri, August 16.

PRESENT—Messrs. Clayer, Wishart, Phillips, B. Arndt, W. Napier, F. R. Arndt, McGilton, Mitton, R. McCreanor, Sterrat, W. Pennyfield, J. Fiedler, R. Koska, C. Virgo, Fowles, Jarvis, Simon, E. Day, Hughes, W. R. Lewis (Hon. Sec.), and a number of visitors.

CULTIVATION OF IRRIGATION AREAS.—Mr. H. S. Taylor, of Renmark, delivered an interesting address. For the irrigated land on the Murray, he said, the Doradillo vine was a safe proposition. Mildura experience was cited to show the probability of an average yield of 10 tons of grapes per acre from vines receiving a reasonable amount of care. The demand for grape spirit was likely to hold for a good while, and South Australian winemakers would not trouble to make their own spirit while they could draw supplies from the river. The Goldmine and Stanwick nectarines were well adapted to the river and very suitable for drying purposes. Certain varieties of apples did very well, producing fruit of a uniformity of size which districts dependent on the rainfall could never hope to attain. The earlier ripening of the river fruit gave it a great advantage at the beginning of the shipping season, when cool chambers were often hard to fill. The varieties of apples specially recommended by the Victorian Department of Agriculture for the northern irrigation districts were the Gravenstein (on its own stock), Cleopatra, Dunn's Favorite, Rokewood, and Mellin's Seedling. The adaptation of the pear to riverside conditions was said to be amply proved. So far, the Williams or Duchess had been almost solely grown on the river for commercial purposes, and that mainly for drying. Under the pre-cooled system of shipment, the Williams was regarded in Victoria as one of the best pears for export purposes Other varieties recommended were the Glou Morceau and Josephine (both of which have done well in Renmark), the Buerre Bosc, and Packham's Triumph. With proper attention to its pruning—avoiding cutting back—the prune promised well on the river. The d'Agen, Splendour, Sugar Prune, and Fellenberg were the varieties most strongly recommended. The d'Agen should not be planted alone, as it needed cross pollination. The apricot, though much neglected of late years, gave promise of coming again Australian prices were very much better than in former years, and export prospects had enormously improved. There was also a good demand for it for canning purposes. Of peaches, the Elberta was recommended especially for canning. It was also a good drier. Heavier crops were produced by the Early Crawford, Salway, and Lady Palmerston. The latter two were also good canning varieties. Other good varieties were the Muir and Foster. For quickness of returns the peach was one of the best of the fruits. The Washington Navel was the best orange for the river, with the possible exception of the Thompson's Improved Navel. More attention should be given to the Mandarin, which came into bearing earlier than the ordinary orange and brought high prices. There had been a marked revival in the demand for lemons, and those trees, when liberally fertilised with animal manures, yielded enormous crops.

Fodder Crops.—Another result of the Victorian experiments was to demonstrate that crops of greater feeding value could be produced from the millets and sorghums than from maize. Maize, however, could be safely cut and fed at all stages of growth, and was especially valuable for ensilage purposes. When planted among young trees or vines these fodders should be set in rows of a sufficient width apart to allow of cultivation. Cow peas yielded a good bulk of fodder, and also made valuable green manure. The pods made a good vegetable dish, treated like French beans, and the seeds, when dried, could be treated like haricot beans. He always made a point of growing some in his own garden. Chou moellier was a variety of kale. Very good results were reported from its use at Nikalapka a couple of years back. Mangolds and beet were much relished by poultry, as well as by pigs and cows. They could be "pitted" or stacked when the tops had been removed, and would keep good for many weeks. For winter greenfeed barley would be found hard to beat. It should be sown with the autumn watering, and should give two or three good cuttings. A good deal might be done by growing potatoes and onions, especially the former, for which the country was well adapted, if the right varieties, such as Up-to-date and Early Vermont were planted. Local conditions were extremely favorable for the sweet potato and the Jerusalem artichoke. Both of these yielded very heavy crops, and would keep in the ground all through the winter. Artichokes were certainly a very valuable pig fodder. It was to the interest of the Government to see the settlers succeed. To further this object butter and bacon factories should be established as soon as any considerable number of settlers were prepared to keep a cow or two and a few pigs. The Government should endeavor, as was being done in New South Wales, to give the settlers every facility for acquiring really good dairy stock on easy terms. For success in dairying two things were essential. Good stock and plenty of suitable feed. The latter was easily supplied on an irrigation block; but to get really good stock was often a difficult matter. A striking illustration of what might be done by devoting an irrigation block to the growth of fodders for pigs and dairying was furnished by the experience of Mr. H. Jacob, of Mildura. Mr. Jacob had formerly 20 acres under trees, vines, and lucerne. He started pig-raising, giving the pigs very little besides green lucerne, and he found them pay so well that he rooted out all his trees and vines, with the exception of a little over an acre of lemon trees. The area under lucerne was extended and other fodder crops were planted. A few cows were also invested in. Heavy dressings of the pig and cow manure resulted in the land, which was not of first-class quality, yielding prodigious crops of maize, as also heavy crops of potatoes and other vegetables. Lemon trees which some years ago were yellowed and sickly and appeared to have outlived their usefulness were wonderfully revived by the droppings of the young pigs turned among them, and subsequently by dressings of cow and pig manure; so much so that they had for years been producing an annual crop of lemons of an average weight of 20 tons to the acre. The fruit from a fraction over an acre of lemon trees had yielded Mr. Jacob a net average return of £160 per annum for the last seven years, and one year's crop had realised no less than £250. That gentleman had extended the area of his holding to 50 acres, all of which, with the exception of the small patch of lemons, was devoted to fodder crops and stock. Mr. Jacob had informed him that his gross returns from the 50 acres came to £20 an acre. Of the 30 acres which he had added to his holding 20 acres were under lucerne (divided into eight paddocks, on which the cows pastured in rotation), and the balance was held for annual, or rather, semi-annual crops. All his land, except that in lucerne and the lemon patch, was made to yield two crops a year—of maize in the summer and oats or barley in the winter. The maize yielded up to 20 tons per acre, and the speaker had been shown a sheaf of maize, 12ft. in height, and one of Algerian oats 6ft. 3in. in height, which were grown on land that had been 23 years in continuous cultivation, and which for many years had yielded two crops a year. Potatoes of the Up-to-date variety yielded two crops a year. Last year the spring crop, sown on August 1st, gave a return of 4 tons to the acre, and the autumn crop, sown on February 1st, yielded 6 tons. Half an acre was reserved and used as a cowyard in which the cows were kept over night. This was made to yield a rich return. It was divided into two paddocks of a quarter of an acre each, and the paddocks were used alternately each half-year. The one not in use at the time was planted. Last summer £20 worth of pumpkins was raised on one of these one-quarter acre lots, and an equal return was expected from the other, which was planted with cabbages this winter. Mr. Jacob had now devoted himself almost entirely to dairying, having replaced most of his pigs by cows, of which he had 16 in milk. His place presented a splendid illustration of the possibilities of dairying on a comparatively small holding. One of the striking features of the farmstead was a round overhead silo, with a capacity of 60 tons. This had been built by the Victorian Department of Agriculture at a cost of £43, for the payment of which three years was allowed. This was filled every year with chaffed maize, and Mr. Jacob reported that the ensilage was eaten greedily by the cows, and that by tramping well round the edges of the silo as it was being filled all waste was avoided. Mr. Jacob had prepared a plan to illustrate his idea of the way a 30-acre irrigation holding should be utilised for fodder crops. The plan showed 10 acres (in blocks of five acres) out of the 30 under lucerne, which was to be cut and fed. The remaining 20 acres were divided into four paddocks, with a suitable reservation for farm buildings and feed lot. A couple of dams at the central corners of the paddocks allowed the stock to have access to water in each paddock. Paddock No. 1 was to be planted with maize on September 5th, and the cattle turned in to graze on January 1st. It was to be afterwards planted with barley and tares on March 1st and grazed on July 1st. In paddock No. 2, maize would be planted on October 15th, to be grazed on February 1st; barley and tares planted April 1st would be ready for grazing by August 1st. In paddock No. 3, maize planted November 15th would be ready for grazing by March 1st; and barley and tares planted May 1st could be grazed by the 1st of September. The last paddock would be planted with maize on December 15th, to be grazed April 1st; and oats and tares planted on June 1st would be available for grazing by October 1st. Thus, with the addition of lucerne hay and the grazing of the lucerne paddocks during the winter, a constant rotation of greenfeed might be secured. With the further assistance of a silo, such as Mr. Jacob possessed, the cattle need never be otherwise than well fed and in good condition.

Berri, October 13.

Present.—Messrs. A. P. Wishart (chair), S. Phillips, C. Foreman, E. G Mitton, S. L. Stearne, R. Arndt, A. R. Staehling. A. Jarvis, A. Simon, V. C. M. Fowles, E. Day, B. H. Arndt, J. Fiedler, W. Powell, J. McGilton, A. P. Wishart, R. Koska.

Pollination—Mr. Phillips read a paper on this subject. He described at length the structure of the flower, mentioning the functions of the sepals, petals, stamens, ovary, and pollen, in addition to the fruit. There was a general natural tendency, he said, for flowers to endeavor to prevent self-pollination. Plants that were cross-pollinated by means of the wind produced very large quantities of pollen. Insects, especially the bee, played an important part in this work also; the colored petals, secretion of honey, &c., being designed with the object of attracting these visitors Darwin, in an extended series of careful experiments, demonstrated that seeds cross-pollinated were more vigorous than those self-pollinated. Most fruits, such as apples, pears, quinces, apricots, peaches, plums, cherries, almonds, &c., each had five petals, five sepals, and many stamens. The ovary was divided into five cells in the apple, &c., and consisted of one cell in the almond and cherry. The fruits also differed, almonds having a leathery outer coat, enclosing the seeds. Plums, cherries, peaches, apricots, &c., had a thin outer covering, a juicy inner portion, and then a shell containing the seed. Apples, pears, and quinces had no shell surrounding the seed. The flowers were so open that numerous varieties of insects were capable of cross-pollinating them. Oranges, lemons, and citrons also bore large open flowers, and were consequently easily cross-pollinated by insects. With marrows, pumpkins, and trombones, the male flower was separate from the female, and in the absence of bees, it was necessary to brush the male flower against the stigma. Broad beans were frequently not pollinated, and consequently failed to set. When watermelons and pie-melons were grown in close proximity, there was a danger of hybridization, so that the seed of such should not be used for planting.

Claypan Bore, October 13.

(Average annual rainfall, 16in. to 17in.)

Present.—Messrs. J. Gray (chair), M. Robinson, S. Gray, J. N. Entwistle, E. Colwill, F. S. Tall (Hon. Sec.), and five visitors.

Harvester v. Stripper.—In a paper advocating the advantages of the use of the harvester, Mr. M. Robinson said it was labor-saving, and a much safer way of dealing with the crops, as the wheat could be removed at once from the paddocks. It was alleged that this machine dirtied the land, but it only replaced seeds of weeds that were already there. It carried the wheat on the near side of the machine, and equalised the draught, whereas the stripper carried the wheat behind the combs which caused it to run sideways. In a competition carried out on Yorke's Peninsula, where a harvester and stripper went round for round through a crop, it was found after the wheat from the latter was motor winnowed that much more clean wheat was gathered by the harvester. Clean bound straw was better than cocky chaff for feed. With ordinary care the harvester should last for 12 or 15 years.

Mr. S. Gray contended that owing to the stumpy and sandy nature of the land in the district the stripper and power winnower were the best means of harvesting a crop. Where the harvester was used, in a crop where the mallee was high, the leaves repeated through the machine and the grain became bespattered with juice: after standing in the hot sun for a few days it would sweat. Cocky chaff mixed with molasses and pollard made good feed for young stock and idle horses. A stripper with a good sharp beater could start as early in the crop as a harvester. The former could also be put into the crop two or three days earlier than the latter, as the grain ripened in the heap. Strips of tin about 2in. deep and 15in. long fastened to the inside top of the stripper would direct the wheat to the near side, bringing the load directly behind the horses. Mr. E. Colwill advocated using both machines. Mr. Entwistle favored the stripper, and the Chairman thought the harvester was best capable of dealing with crops of 12bush. or over.

Coomandook, October 11.

(Average annual rainfall, 18·01in.)

Present.—Messrs. W. Ninnis (chair), A. Bald, H. Gosden, N. Brown, L. Crouch, J. Brown, J. Bald, C. Mitchell, P. C. Potter, A. Ritchie, R. William, W. Brown, C. Hillman, H. Hughes, F. Cordes, M. Wilkin, C. M. Wilkin (Hon. Sec.)

Breeding and Care of Horses.—Mr. A. Bald read a paper in which he said the most suitable class of horse for farm work in this district could be secured by mating good draught mares to roadster stallions. The result would be a horse with a good body and fairly clean legs. It would stand plenty of work, especially on the roads, and would walk quicker than draught horses. In the absence of plenty of good feed in the paddocks mare and foals should be provided with chaff and bran and a sprinkling of oats. As it was difficult to get a good cut of hay in this district it was a good plan to sow a considerable area of oats and strip this, bagging the grain without cleaning it. This could be fed to the horses at the rate of one bag mixed with three bags of cocky chaff. While some members preferred the heavy draught, the majority favored the medium draught with clean legs as the most suitable for this country Mr. Peake thought better and more saleable foals would be secured from draught stock. Members thought oats and cocky chaff good feed when hay was scarce, but the majority favored cleaning the oats, not bagging it direct from the stripper. It was a good plan to crush the grain. Water should be available in the yard to the horses at all times.

Coonalpyn, October 17.

(Average annual rainfall, 17·49in.)

Present.—Messrs. A. J. R. Gurner (chair), H. Bone, J. Hill, G. H. Wall, E. E. Williams, R. F. Venning, J. J. Cronin, D. S. Cronin, F. Pitman, G. E. Venning, and eight visitors.

Lime-Burning.—A short paper on this subject was read by Mr. J. Hill. For burning lime, he said, an excavation about 10ft. across and 7ft. deep should be made in the earth, with a smaller hole on one side to facilitate lighting the fire. The latter should be so situated that water would not run into the kiln. A bed should be made of dry twigs, with a few roots to take the weight and ensure the fire spreading evenly. Then a layer of about 2ft. of dry roots, well trimmed, should be added. On this the moderately hard stone could be broken to about 6in. in size. The stone should be kept somewhat heavier in the centre. Another layer of well-trimmed green roots should be added, and then a heavier layer of stone, broken to about 4in. Alternate layers of roots and stones should follow, the top layer of the latter being about 2in. in size and about 3ft. above the surface of the ground. When the fire was well alight the bottom draught should be blocked. Mr. F Pitman advised lighting the kiln by forming a hole about 8in. in diameter in the centre. It was very necessary to keep the heat down. Mr. Wall thought sandalwood and green mallee better than mallee roots for lime-burning.

Lameroo, October 18.

(Average annual rainfall, 16·55in.)

Present.—Messrs. Cameron (chair), Mayo, Jericho. Dragomuller, Tink, Wray, F. W. Eime, Martin, Kakoschkie, Koch, Davison, Cameron, E. J. Trowbridge, Gibbons, Ross, Townsend, S. G. Trowbridge (Hon. Sec.), and two visitors.

The Agricultural Bureau.—The Chairman read a paper under the title "The Advantages of Becoming a Member of the Agricultural Bureau." He dealt at length on the educational benefits to be derived from active association with this institution, and mentioned the excellent opportunity which it afforded of bringing the farmer in direct contact with the agricultural expert. Members discussed the paper, and Mr. Koch expressed the opinion that a great deal of good would be done if more experimental work were undertaken by members.

Takeall.—Mr. E. J. Trowbridge reported that he had 20 acres of crop on well-worked fallow badly affected with this fungus. Where oats had been grown previous to fallowing the crop was unaffected. Members agreed that the practice of sowing oats on land likely to carry crops troubled with this disease was advisable.

Monarto South, September 13.

(Average annual rainfall, 14in. to 15in.)

Present.—Messrs. G. Patterson (chair), A. P. Braendler, J. and H. Frahn, A. Forbes, G. Gogol, A. Harper, A. and E. Hartmann, G. R. and B. Paech, G. Thomas, A. Schenschen, C. F. Altmann (Hon. Sec.), and 10 visitors.

Takeall.—In a paper on this subject, Mr. A. Hartmann said the practice of cropping every fourth year and grazing during the intervening period kept the land in good heart, and discouraged takeall. There was also less trouble with this disease in stiff and loamy soils if they were cultivated after rains during June, July, and August. Cultivation when the land was dry seemed to encourage it. Dressings of phosphate and lime immediately after fallowing increased the yields, and kept the crops free of the fungus. When land was cropped every second year, the first crop should be wheat, then grazing, the third year oats, fourth grazing, and then wheat; a crop of wheat being secured every fourth year. One member thought a good stubble burn very effective in preventing the disease.

Morgan, October 11.

(Average annual rainfall, 9·29in.)

Present.—Messrs. R. Wohling (chair), O. Hausler, J. B. Hoffman, J. Heppner, C. H. R. Wohling (Hon. Sec.), and one visitor.

Pig-Raising.—The Hon. Secretary read a paper on this subject. He recommended the Berkshire-Essex cross as a good paying animal. The pure Berkshire was difficult to keep in condition. On the other hand the Essex was easily kept in condition, carried a light coat of hair, and was easily dressed when killed. The flesh was tender. He preferred to have the sow farrowing in October or November. The sow should not be under 12 months old and the boar 15 months old when breeding was commenced. Immediately after farrowing the sow should be fed for three or four days on sweet milk and pollard, green lucerne being given in the morning only. After harvest he made a practice of running the pigs on the stubbles until seeding, when they were marketed. He had found the business profitable. The Chairman mentioned that the prickly pear, finely chopped up, made good summer feed for pigs and poultry.

Parilla, October 9.

(Average annual rainfall, 16in. to 17in.)

PRESENT.—Messrs. H. G. Johnston (chair), E. J. Kerby, H. W. Harrip, J. H. Daniel, M. J. McAskill, J. Roachock, P. W. Lewis, M. Shannon, A. J. Stevens, C. Foale, P. Harrip, C. Moyle, M. Rush, S. H. Evans, G. E. Gregory, G. Neindorf, C. Millsteed, J. H. Dewhurst, P. J. Browne (Hon. Sec.), and eight visitors.

LUCERNE CULTIVATION.—An interesting address on this subject was delivered by Mr. J. H. Daniel. Four different growths of lucerne were exhibited. One had been sown two years ago and sprinkled at various times. During the past 12 months it had been cut on eight occasions. Five weeks ago it was cut level with the ground, and at the present time was looking extremely well and had reached a height of 2ft. The second sample was from a plot of four acres, sown on the 6th August last year with a crop of wheat at the rate of 10lbs. to the acre; 25cwts. of hay per acre had been cut from the area. The lucerne was cultivated six weeks ago and was now 9in. in height and very thick. This plot had not been irrigated and little rain had fallen on it. The third sample was from an area sown at the rate of 1lb. of seed per acre. The plant was very vigorous, and indicated that if the practice of distributing seed in all the paddocks were followed, excellent fodder for stock would be secured. The fourth sample was from a plot sown at the rate of 3lbs. per acre with a hay crop. The lucerne averaged from 6in. to 12in. in height and gave every indication of providing excellent feed in summer. The method of sowing recommended by Mr. Daniel was to take the tubes out of the hoes of the drill and spill the seed on to the surface of the ground, following which, some light bushes should be dragged over the surface sown. The lucerne should be mixed with the manure and put in after the grain was drilled. Mr. J. Lee thought it better to cut the lucerne than to feed it off.

HAY-MAKING.—Mr. B. G. Neindorf read a paper on this subject. Wheat, he said, should not be cut for hay until the grain had nearly matured, as if cut too green it would lose weight. Oats should not be cut until nearly ripe, otherwise the hay would be bitter. The sheaves should be stacked in long rows, and if there was little danger of wet weather, they could be placed flat on the ground. They would then lay closer than if stood up. The hay should remain in the stooks for 14 days before being carted, but if the stooks were put flat on the ground it could be stacked somewhat earlier. Long stooks were best, as rain did less damage to them. Care should be taken not to commence the stack too large. For wheaten hay, he preferred White Tuscan or Majestic. When carting, it was advisable to take small loads that could be thrown out quickly. A large tightly tied sheaf was much easier to handle than a small loose one. The best hay was secured by first drilling in wheat and then cross-drilling with oats. In reply to a question he said that hay could be left in the paddock for a couple of days before being stooked, and should not be stacked until it was dry enough to break or crack when bent. Mr. J. Gray (Chairman of the Claypan Bore Branch) said that if the crop were allowed to stand long enough for one to secure the benefit of the grain, the best part of the saccharine in the straw was lost. When a good rain fell just about hay harvest time, the crop could be cut at a much greener stage, as the grain would ripen in the heads after it was cut. Sydney chaff buyers preferred hay that was cut green. Corn could be made up with the addition of bran. Mr. McAskill considered hay cut on the green side the best for stacking, but when intended for market, it should be cut a little later, as it weighed better. Mr. Daniel recommended cutting the crop when the bloom had gone off, and the wheat was in a forward milky stage. The saccharine was then distributed over the full length of the straw. Mr. Johnston said more weight was secured if wheaten hay were left until the grain was full. Oats, which were preferable for feeding to working horses, should be left until the grain was almost ripe.

Parrakie, September 13.

(Average annual rainfall, 16in. to 17in.)

PRESENT.—Messrs. T. Lewis (chair), F. Brinkley, R. L. Beddome, T. P. Congdon, S. R. and W. J. Good, C. Heinzel, R. E. Jose, C. Nadebaum, W. Threadgold, J. G. Temby, H. Diener (Acting Hon. Sec.)

IMPLEMENTS.—Mr. J. G. Temby opened a discussion on the advantages of using draught springs on tillage implements. By using a draught spring bridle plough, he said, the horses' shoulders would not be jarred any more than if a spring pressure implement were used. The swings would carry much steadier, and this was a big advantage to a team. He was of the opinion that a four-furrow spring was strong enough for use behind seven horses, as a spring with more resistance would be nearly ineffective. On a scrub roller it minimised the danger of breaking trace chains, and he recommended its use on harvesters. Mr. Beddome used a six-furrow spring behind seven horses in the plough and roller, and the horses were less troubled with sore shoulders since he had been using the springs. Mr. Jose had used a four-furrow spring behind eight horses when ploughing heavy land in the middle north. Mr. Threadgold thought a five-furrow spring was strong enough to put behind eight horses, and anything larger was too strong. There was a disadvantage in its use, however, as it placed the horses too far away from their work. Mr. Congdon favored the use of a strong spring, because one that closed right up was of no benefit. It would let the farmer into the trouble he was trying to avoid. Small springs could be used more in the tugs on tip drays and English wagons.

Pinnaroo, October 11.

(Average annual rainfall, 16·74in.)

PRESENT.—Messrs. P. J. Edwards (chair), A. M. Burman, F. G. Bonnin, M. H. Chappell, R Edwards, H. G. Fewings, L. M. Ferguson, H. C. Hill, G. E. Hallett, W. H. Kelly, C. Lee, H. Ledger, J. Letheby, B. H. Nash, A. J. Reed, J. Scales, T. B. Shiels, H. Venning, and P. H. Jones (Hon. Sec.).

BREEDING AND HANDLING HORSES.—Mr. R. Edwards dealt with this subject in a paper in which he said good horses were necessary and there was no room for the lean, lanky, creature, neither draught or light "A thoroughly good sire," he said, "is the most important factor. It is more profitable to pay £4 or £5 for the use of a good horse than £1 or 30s. for the services of a mongrel and a second-rater. I favor the short, thick-set sire with plenty of vitality and showing good bone and hair and not set too high If a well-bred sire of a stamp as described is used it matters little about the pedigree of the mare so long as she is a fairly well-proportioned and roomy animal. On no account would I breed from a jib or a mare with a vicious temper. I consider the best age to mate a mare is at about 3 years, so that she drops her first foal at 4 years or thereabouts. I would have the mares alone when foaling, away from all geldings and youngsters, as many a good foal has been lost through the interference of other stock. However, a strict watch should be kept on them from a distance, so that if anything should go wrong it is at once detected. For this reason I favor a paddock not far from and in full view of the homestead. If this is not possible they should be looked to first thing every morning and last thing at night. When the foals are dropped the mares should be well fed and looked after and stabled should the weather become wet and cold. Allow the foals in the stable with their mothers as much as possible, as this not only tends to quieten, but teaches them to readily drink from the trough and eat from the manger. Rock salt should always be at hand for both mothers and foals. Weaning should take place at from six months to eight months. I favor taking the foals straight from the mares and not allowing them one drink a day for a while as many people advise. This only prolongs the agony and tends to keep up the milk supply rather than diminish it. Occasionally a mare is troubled with an excess of milk, but not often. It is generally necessary to milk a little from them for a day or two. If there is an extraordinary supply at weaning time, as is sometimes the case, it will be found that bathing the udder in a strong solution of salt and water will very soon overcome the difficulty. If possible, the foals should be put in a small paddock with plenty of natural feed. They will naturally go back a bit, due principally to fretting. They should have all they can eat of good feed with a liberal allowance of corn. I favor oats for growing colts. It is advisable to keep the foals separated from the mares for at least three months, as a badly weaned foal is always a nuisance. When yearlings, or about September, they should be brought in for branding and castrating. For the former I prefer to rope the colts rather than use a crush pen, as it is all valuable education, and will go a long way towards preparing them for breaking-in. On no account would I brand when the animal is down, for though the front legs be not tied it is difficult to get the exact position, and it often results in an altogether illegible brand. I prefer the emasculator to the clamp and searing irons for castrating, as it is much quicker, and the suffering and straining in the ropes is much lessened. Hot, windy weather should be avoided for this operation and a calm, warm day selected. Thorough cleanliness should also be strictly observed. The colts should never be short of feed right up to the time they are broken in, and even after. Break them in at 2½ years for ordinary farmwork. I do not like breaking at 2 years as the weather is usually hot and the youngsters get very much distressed over their work; and apart from that, if broken at 2 years, or just before harvest, there is a tendency to overwork them through the extra busy period. Many farmbred colts can be caught in the stable alongside a quiet horse; but failing this I would rope round the neck with a slip knot and draw the animal to a stout post. Put on a halter by which the horse can be held or led. On no account put on the winkers until all the other harness is in place, as I believe in letting the horse see all that is going on around him. It may take a little longer to get the harness on for the first time or two in this way, but the animal soon gains confidence, knows exactly what to expect, and becomes tractable. If the winkers are put on first he will naturally jump every time he catches sight of the operator, and this will encourage nervousness. If possible avoid all rough handling, particularly in the early stages, as it takes a colt a long time to forget a thrashing. Patience is a most important factor. When a good fitting collar and hames and a strong pair of winkers have been put on the colt should be led about until he becomes used to the harness, and then put between two old horses and drive round, always leaving the halter on in case of accident. If he is at all troublesome it will be found a good plan to couple the horses from the neck as well as the bit, having the neck couplings a little tighter than those on the bit. This takes a large amount of the strain and irritation from the naturally tender mouth. A sore mouth is often the cause of quite a display of vice. Generally speaking, if a colt is farmbred, after being driven awhile in this manner, he will go straight into the team; but if not considered quiet enough for that he may, with advantage, be attached to a light log and allowed to pull that about for awhile. Half a day's work is quite sufficient at first until the horse becomes used to it and gets a little hardened. Then he may do a full day, providing it is not too heavy. I do not favor working youngsters too hard for the first six months. When brought in from work the shoulders should be washed with a weak solution of Condy's fluid. This not only cleanses but toughens the skin, and if a well-fitting collar is used there should be very little danger of scalding or sore shoulders. Avoid all risks when a colt is in the team as he rarely forgets a runaway or a general upset. Every care should be taken not to excite him more than necessary, and to keep him as quiet as possible. It must be remembered that he has everything to learn, and too much should not be expected of him at first. After working in chains for a while it is a good plan to put him into the shafts of the wagon and change him about till he becomes used to all kinds of farmwork. If this plan is adopted one will never be met with the difficulty of having a horse who will only work in one particular place." Mr. Ledger was strongly in favor of breeding from pedigree stock. An animal from a good strain often left stock of a better quality than the good-looking animal without a pedigree. He always accustomed his foals to tying up when about three weeks old, as they were then far less trouble when it came to the time of handling. Youngsters did not need corn; preferably he would feed on hay cut on the green side. It was wise to get the animal used to one place in a team. Certain of his horses had never worked but in the one position, and he found it a great advantage. Mr. Scales believed in handling them when 2 years of age, as they would then be ready to take their place in the team at seeding-time. It was inadvisable, however, to put the horse to heavy labor during the early stages of its education. It did not matter much whether it was broken at 2 years or even 4 years. It was the treatment subsequent to handling that was the most important point. He had never found it necessary to keep the foals away from the mares for three months during weaning. In most cases 14 days was sufficient. Mr. Ferguson favored the open bridle in preference to winkers. He would apply the brand so that it came below the chain draught. Mr. Lee thought light work and kind treatment two essentials which must not be overlooked. Mr. Shiels remarked that in handling young stock a lot depended on common sense. Numerous factors prevented any hard and fast rule as to just when a colt should be weaned and handled. Individual cases must receive special attention. Mr. Venning would first handle horses at 2 years, and then turn them out again for several months before putting them to general work. He favored the use of the open bridle. A horse should be taught to stand and start. Mr. Chappell did not care to give oats to young horses, he preferred bran. That fodder was the best that could be given for the making of bone without fear of overheating. When breaking he would not join by the bridle coupling; this was too much of a jar on the tender mouth and often was responsible for old horses throwing up their heads. He would join them with neck ropes until they were accustomed to the surroundings

Waikerie, October 13.

(Average annual rainfall, 8·89in.)

Present.—Messrs. E. J. Burton (chair), R. Stanley, F. B. Williams, W. J. Green, F. G. Rogers, J. J. Odgers (Hon. Sec.).

Weather and Crops.—It was reported that the weather during the month had been very dry, and during the week immediately preceding the meeting, exceedingly hot, but a good rain was falling, and this promised to continue. There was an exceptionally good flowering of oranges; and peaches and apricots had set splendidly and promised a good yield. Wheat was looking remarkably well, especially on early sown fallow. Hay-cutting had been commenced, one member reporting a yield of one ton to the acre.

SOUTH AND HILLS DISTRICT.

Blackwood, October 13.

(Average annual rainfall, 27in. to 29in.)

Present.—Messrs. W L. Summers (chair), Wilson, Scherer, Eglinton, A. W. and A. A. Magarey, P. H. and D. Williams, Sibley, Porter, Penno, G. W. Summers, Philps, H. Sullivan, Winser, Davis, Goutch, Hilfers, Gamble, and Savage (Hon. Sec.).

Potatoes.—Mr. D Williams contributed a lengthy paper in criticism of articles appearing in the July, August, and September numbers of the *Journal* on the subject of potatoes. He mentioned that in cutting smooth tubers that had a crown of eyes, as it were, it was always advisable to include one of these eyes in each set. Round seed was best, as it did not rot so readily with excessive moisture. Lime should be added to land for potatoes in this district, and manures should be worked well into the soil before the crop was put in. Earthing up should be done when the plants were 3in. or 4in. high, the second hoeing being about a fortnight later.

Manures.—Mr. A. A. Magarey also dealt critically with articles on manures appearing in the last three issues of the *Journal.* The following is taken from his paper:—"In dealing with this subject, we should understand the connection between the chemical requirements of the plants and the part played by soils and manures in supplying these. We will not be far wrong if we assume that all plants are built up of the same elements combined together in different proportions. These are carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, silicon, chlorine, and about half a dozen metals in combination. For example, different combinations in varying proportions of carbon, hydrogen, and oxygen give us that large class of bodies known as carbohydrates, including such unlike substances as starch, sugar, woody fibre, cellulose, gum, &c. Hydrogen and oxygen combined give us water; nitrogen united with the above elements forms the nitrogenous constituents of the plants; for instance, gluten in wheat and the albuminous matter in the pips and seeds of fruit. Very little is known of the metals, their disposition in the plants, and the changes they undergo. We are able to detect their presence in the ash in combination with oxygen, phosphorus, sulphur, and chlorine. The quantities of the elements not only vary in different plants, but in the same plant some elements are present in quantities out of proportion to the others. More than one-half of the bulk of all growing plants consists of water. In watery fruit, such as watermelon or cucumber, the percentage of water would be from 90 per cent. to 96 per cent. Of the remaining portion of the plants the compounds of metals rarely exceed 2 per cent., and are more often about 1 per cent. The point of importance for us to keep in mind is, that each of these plant constituents is as necessary for the wellbeing, even for the existence of the plant, as any other, whether present in the plant in large or very small quantities. If a single one of the ash constituents is insufficiently supplied, if the potash is deficient, or the iron, the plant suffers, although the amount of such element does not exceed a fraction of 1 per cent. The volatile portion (that is the part that is burnt away, leaving the ash) of the plant, the water carbohydrates and nitrogenous matter is for the most part abundantly supplied by the air and rain (with the exception of the nitrogen in some plants). That is to say, about 98 per cent. of the plant food is derived from air and water. From the soil the plant gets the remaining 2 per cent., consisting of lime, iron, magnesia, potash, soda, and perhaps manganese combined with sulphuric, hydrochloric, and phosphoric acids, together with nitrogen as already stated. These substances it is the function of the soil to supply. The object then of manuring is to assist the soil in giving to a plant a portion of the food necessary for its growth. Of the ingredients to be supplied by the iron, magnesium, sodium, manganese, chlorine, sulphuric acid, and silicon are present in nearly all soils in far greater quantities than the plant requires, so that there is very little danger of their becoming exhausted. The ingredients that we have to supplement by means of manures are reduced to four, namely, lime, potash, phosphoric acid, and nitrogen. Lime is probably present in most soils in quantities sufficient for plant food, and it is seldom necessary to apply it for that purpose. Its principal functions when applied to the land are, firstly, mechanical, in modifying the physical character of the soil, and, secondly, chemical in rendering available certain insoluble plant foods. Lime acts also, however, directly as a plant food. The different classes of artificial manures fall under one of the above headings, according as they supply lime, potash, phosphoric acid, or nitrogen. The food thus supplied by the soil is taken up in solution by a peculiar process of suction by means of the roots. It is therefore necessary that such food should be in a soluble form to be of any use to the plants, which are unable to use insoluble material. By soluble we mean soluble in water or weak acids present in the soil, or secreted by the plant roots. This is what is meant by the mineral constituents being 'available for plant food'; and when the terms 'latent' or 'dormant,' and 'active' are used, they simply mean insoluble or soluble in the water taken up by the roots of the plants. The manures known as quick-acting manures are those containing their potash, &c., in a soluble form, and slow-acting manures are those which contain these substances in a more or less insoluble form and must undergo a gradual decomposition before their phosphoric acid, potash, &c., are available for plant food. A good example of a quick and slow acting manure is found in the state of the phosphoric acid in superphosphate and bonedust. From the foregoing we can see that all plants do not take up the constituents supplied by the soil in the same proportion, and consequently are benefited differently by different manures. For instance, no amount of nitrogenous manure will materially benefit a pea crop, but a small quantity added to land in which wheat is to be grown will largely increase the yield. In connection with the application of artificial manures we have the following points to consider:—(1) What are the chemical requirements of the different crops? (2) In how far do our soils supply these requirements? (3) In what direction are they to be assisted by manure? Plants, like animals, give the best results when fed in a rational manner. They require a constant supply of plant food during active growth, and if we put a heavy dressing of manure on the soil one year, the trees are only able to use what they require for that season's growth, and during the winter a large proportion of the manure is leached out of the soil and lost. For the next year or two the trees are very apt to suffer from the lack of the very plant food this manure was intended to supply. This applies more particularly to the active manures. On the other hand, if we applied just sufficient manure each year for the trees requirements, very little would be lost by leaching, and the trees would do much better for the same amount expended. Difference of opinion exists as to what is the best time to apply manures in the orchard. This is a matter that is well worth experimenting with to find out what is really the best practice. As a general rule slowly soluble manures should be applied sometime before they are actually required for plant food, say some time in the autumn. Soluble manures, such as superphosphate, sulphate of ammonia, nitrate of soda, nitrate of potash, sulphate of potash, &c., should not be applied until the tree is in active growth, if possible, that is in spring. For if they are applied to the soil any time before they are required they are apt to be leached out by heavy rains before the trees are in a position to use them. In parts that have summer rains it might be advisable to apply the more soluble manures in two or three dressings, at intervals of a month or two, but in this district I hardly think that necessary. Nitrogen is required for the albuminous matter in fruit, and this occurs in largest quantities in the pips and kernels. Potash forms the largest proportion of the ash of the fruits, and phosphoric acid is essential to all fruit, forming a large proportion of the seed in which respect it is similar to nitrogen. In a paper on page 1450 of the July, 1913, issue the writer places the value of farmyard manure at 9s. 9d. per ton This estimate is based on the amount of phosphoric acid, potash, and nitrogen contained in the manure, but we have also to take into account its value in improving the mechanical condition of the soil. Farmyard manure to be of any real value must be properly kept. The writer states that 'nitrogen, the most valuable part of the manure, is difficult to obtain.' This loss of nitrogen can be overcome by proper care. The temperature of the manure in fermenting should not be allowed to rise higher than about 86°, the rise of temperature can be prevented by pressing the manure well together and by pouring the liquid over it. Humic and ulmic acids are formed, which unite with and fix the ammonia and potash. Gypsum prevents waste of nitrogen and kainit, if added, will fix the ammonia. If the manure is allowed to overheat the ammonia is lost. Unless farmyard manure is well rotted before being placed in the orchard it is liable to spread many undesirable weeds. Spread it over the ground and plough it in some time in the autumn It is better suited for crops where rank growth is desired than for fruit trees. Cabbages, &c., do particularly well with farmyard manure. Lime unites with clay, setting free potash and other alkalies. It acts on vegetable matter, setting free ammonia, water, nitric acid, and carbon dioxide, with which it unites, tending to destroy excess of humus. It neutralises organic acids (humic, ulmic, geic, &c.), thus sweetening the soil and decomposes excess of ferrous sulphate; takes up nitric acid as formed by nitrifying bacteria. It is a plant food itself. It aids in the formation of secondary silicates. It opens up clay soil by the curdling or floculating effect it has on the particles, and binds together sandy soils, makes them more retentive. Lime also renders harmless injurious salts of copper, iron, &c. Quicklime should be applied to all clayey and humus soils, but lighter soils are best treated with a mild form, such as marl. Lime has a tendency to sink into the soil, and should be spread on the surface and harrowed in. The old style was to give heavy dressings at long intervals, but the present practice is to give light dressings more frequently. Green manuring must not be overdone, because the soil is liable to become sour with the excess of organic matter. A good plan is to sow lime just before the crop which is to be ploughed in. The lime, besides neutralising the acids, fixes the nitrate salts which are formed as the crop decays. At Renmark they disc over the crop and let it dry before ploughing it in; they claim that this prevents the land becoming sour. About the best crop on the whole to grow for green manure is field peas. Berseem may be all right but has not been tried in this district, the seed is probably too expensive. Field peas planted with the first rains will ordinarily mature in time to be ploughed under." The Hon. Secretary stated that Berseem had been grown at the Government Orchard last year as a manure crop, and although the autumn rains were deficient the Berseem made good growth for ploughing under.

Orchard Work.—Papers on this phase of agricultural activity came in for criticism by Mr. R Eglinton. Where tree-planting was to be done in good, deep soil, he did not think it necessary to use the two-pronged pick, as advised by the Horticultural Instructor; the ordinary grubber might be used. He agreed that root crops could be grown without damage to the trees whilst they were young, but cereal crops, even in narrow strips, as had been advised, should be left alone. Ploughing preparatory to planting should be as deep as possible. It was not advisable to put grass, &c., round the trees to assist in the retention of moisture, as this harbored disease, and encouraged the roots to grow near the surface. More attention could well be given to the planting of prunes. The best time to prune old apple trees was when a full crop was expected.

Cherry Gardens, October 14.

(Average annual rainfall, 35·03in.)

Present.—Messrs. H. Jacobs (chair), C. Lewis, C. Ricks, T. Jacobs, sen., G. Hicks, A. Broadbent, S. W. Chapman, T. Jacobs, jun., J. Tozer, H. and C. Jacobs, and H. Lewis

Potato-Growing.—In a paper on this subject Mr. C. Lewis said that for this crop he preferred seed that was just ready to shoot, and of a size that could be conveniently cut into three sets. The ground should have a good coating of stable or cowyard manure, which should be ploughed in to a depth of about 9in. during the dry weather. It should be again ploughed before planting. If it were intended to dig the area before planting, oats, wheat, or barley could be sown for greenfeed or for digging in. The potatoes should be put in rows 2ft. apart, with 1ft. between the sets in the rows. The use of the dibber was the best and quickest way of planting. Immediately the plant showed through the ground it should be well harrowed, and when the rows could be seen, hoed. Banking should be done a fortnight later. This would assist in destroying the weeds and facilitate the work of digging.

Forest Range, October 2.

(Average annual rainfall, 35in. to 36in.)

PRESENT.—Messrs. W. McLaren (chair), J., F., and E. Green, E. Rowley, H. Sass, R. Collins, O. S. Pollard (Hon. Sec), and one visitor.

BORDEAUX MIXTURE AND OTHER FUNGICIDES.—A discussion took place upon a bulletin issued by the Department of Agriculture and dealing with fungicides and Bordeaux mixture. Members thought the formula given for Bordeaux mixture, viz., 6lbs. bluestone, 4lbs. lime to 40galls. of water, too strong. They favored 4lbs. bluestone, 4lbs. lime to 50galls. of water, and for Burgundy mixture they recommended 2½lbs. bluestone and 5lbs. soda to 40galls. of water. There was a diversity of opinion as to whether Bordeaux mixture caused the rusty appearance on Jonathan and Williams' Favorite apples. Some members contended that it did so regardless of the strength of bluestone used. Others had noticed apples that had never been sprayed for fungi affected in this way.

Gumeracha, September 16.

(Average annual rainfall, 33·30in.)

PRESENT.—Messrs. B. Cornish (chair), A. Moore, J. Monfries, A. W. Cornish, T. Redden, and W. B. Randell.

COMPULSORY DIPPING OF SHEEP.—Mr. B. Cornish read a lengthy paper in which he drew attention to difficulties which arose in connection with the dipping of sheep, both, in so far as the law itself was concerned and in the administration of it. In order that these might be removed he made the following suggestions:—"(1) As there may be pastoral areas in the Far North where different conditions exist, the State should be divided into districts (not necessarily small ones). Wherever ticks or lice are found such parts should be declared infected districts. (2) In all infested districts every person who owns, or is in charge of a sheep shall, within, say, a month of shearing that sheep, cause the same to be properly dipped in a preparation made for the purpose, and of such strength as shall fulfil the instructions of the maker as to the strength required for effectually destroying all vermin that may be found on such sheep. (3) The work of inspectors shall be to see that this is well done. There will then be no vermin worth troubling about. (4) Every sheepowner who dips on his own premises should be compelled to make a declaration that all his sheep have been efficiently dipped. This would be sufficient in his case, because the one who goes to the trouble and expense of erecting appliances would scarcely then fail to make good use of them. (5) Any sheepowner not having appliances of his own shall cause his sheep to be dipped at some convenient place, and shall produce a certificate duly signed by the owner of such dipping pens showing that his sheep have been efficiently dipped. (6) No owner of any sheep shall, after shearing such sheep, sell the same, nor have it any public place, nor travel it on any public road, except to or from his own pasture, or for the purpose of dipping, until such sheep has been properly dipped. These regulations would not entail hardship on any one, as one or two dipping yards in one district where flocks are small would be sufficient. Arrangements could, no doubt, be made with the owners for use of yards for a fee to be agreed upon in a district. Sheepowners, as a rule, are fairly generous, and in our district have provided yards for nothing; but that is too much to expect, as these yards are somewhat costly to make and keep in order. The time occupied in dipping, say, a hundred sheep, is very little, perhaps half an hour where yards and pens are convenient, and the dipping is really a distinct benefit to the sheep. It is a splendid remedy, or rather, preventive of the blowfly. I have never yet lost a dipped sheep from this trouble." Members generally concurred that the difficulty could be overcome by all sheepowners dipping their sheep immediately after shearing.

Hartley, September 19.

(Average annual rainfall, 15in. to 16in.)

PRESENT.—Messrs. B. Wundersitz (chair), W. Bermingham, F. Lehmann, A. Wundersitz, P. Wagenknecht, T. Phillips, D. Clark, F. Bruns, J. Hudd, B Klaebsch, H. Cross, S. Beavis, J. M. Hudd, A. Stein, J. Stanton (Hon. Sec.), and 18 visitors.

HOMESTEAD MEETING.—The holding of Mr. J. Hudd was inspected by members and visitors. Whilst the crops were not as promising as usual on account of the somewhat dry season, some of the members estimated a return of about 16bush. of wheat and a cut of one ton of hay per acre. The Chairman of the Advisory Board of Agriculture, Mr.

G. R. Laffer, delivered an address, and expressed his pleasure at the large attendance, especially of young men. Messrs. W. F. Adams, C W. Taylor, and J. Stanton also spoke expressing appreciation of the efforts of Mr. Hudd in making the gathering enjoyable.

Hartley, October 15.

(Average annual rainfall, 15in. to 16in.)

Present.—Messrs. B. Wundersitz (chair), S. Beavis, H. Cross, P. Wagenknecht, J. M. Hudd, W. Bermingham, S. Pratt, A. Stein, F. Lehmann, F. Bruns, J. Hudd, J. Stanton (Hon. Sec.), and one visitor.

Afforestation.—Mr. S. Beavis read a paper on this subject. In nearly all countries of the world attention was being given to this subject, he said, and with the increase of population in Australia, large quantities of timber would be required for railway sleepers, building purposes, mining, furniture, &c. Unless the timber which had been destroyed was replaced there would be a considerable shortage. He recommended leaving belts of trees around the farms when they were being cleared, and in the absence of natural timber, planting trees for shade and shelter. The planting of trees in the streets as had been done at Orroroo was an excellent idea. It was hard to understand why large tracts of country in this State were not being planted with jarrah, sandalwood, and ironbark, and other timbers of commercial use that could be profitably grown. It was thought by members that this district was rather too dry to secure a profitable growth of timber, as the trees would take too long to mature.

Inman Valley, September 13.

(Average annual rainfall, 26in. to 27in.)

Present.—Messrs. H. J. Meyer (chair), H. J. Dennis, H. J. Jagger, R. J. Martin, V. G. Tugwell, R. Rose, F. J. Barratt, M. J. Meyer, T. G. Rose, and H. M. Parsons (Hon. Sec.).

Sheep and Wool.—Mr. M. J. Meyer read a paper on this subject, as follows:—"The most profitable industry in this district is sheep-breeding, and the three sources of profit connected with it are—wool, fat lambs, and mutton. The best returns cannot be obtained from working the three together. In raising fat lambs for market it must be borne in mind that the best woolled class is not the best fattening class. The lighter woolled varieties, such as the Shropshire, Southdown, Dorset Horn, or Leicesters are more suitable. Wool and mutton can be successfully managed, and, taking climatic conditions here into consideration, are the two main sources of profit. The aim of every sheepowner who wishes to get good results should be to find out the most suitable class for his country, and keep as near as possible to that. This will count a great deal in the get up of the clip at shearing time. Always keep the best sheep, as a good one will not cost any more to keep than the inferior. Never overstock, because partial starvation at any time of the year affects the growth of the wool. More could be done in this district, in the fat lamb industry, by the cultivation of peas for topping up the lambs. They could be produced just at the time when the earlier districts were slackening off. Pea-fed lambs command high prices in the Adelaide markets. In my opinion there is a greater return from them than anything. This part is more the home of the crossbred than the Merino; the latter very rarely does well, and if bred in the district is small-framed compared with the Merino grown in the northern areas. For scrub country I would not recommend anything but the Merino, on account of their being closer in the wool, which does not get torn and worn off like the open wool. For wool and mutton I advocate the Comeback. For breeding select first-cross ewes. They are better milk producers, and stand our cold wet climate better than the Merino. With these first-cross ewes mate the Lincoln ram. The ewes produced from the first-cross and the Lincoln ram are then mated to a Merino ram, thus producing the Comeback. This class will cut a heavy fleece of wool, which will range amongst the top prices in the market. The ewes are very much sought after for breeding purposes, and it is to be regretted that a line of 200 or 300 is difficult to obtain. The wethers are very heavy mutton sheep, and fatten quicker than either the Merino or Lincoln. Do not keep on breeding from the progeny too long, as they get too much on the Merino side, which results in smaller frames. Sell out occasionally and start afresh. The rams should not be too old, but vigorous. They leave their mark on many: the ewe is of great consequence, but the ram greater still, and thus with the sire is not the place to economise. Lambs should be tailed at about three weeks old. If they are allowed to get too old the loss of blood is greater, and the lamb takes longer to recover. Ewes and lambs should be driven as quietly as possible to the yards, in order not to get the latter overheated. Clean instruments should be used, and it is a great mistake to let the lambs go into a dirty yard after the operation. Trouble with blood poisoning will be encountered if this is done. Ewes should always be breeched before the winter, to obviate the fly pest. This will also mean less trouble with skirting at shearing time. Every sheepowner should dip his flock once a year: sheep infested with lice and tick will never do well, and the wool has a dirty, discolored appearance. In dealing with Merino wools there are three factors to be taken into account—first, the quality of the wool by which the value is arrived at. This factor, or quality, will be represented largely by the size of the sheep. Second, the length and strength of the staple which determines to what use the wool may be put, *i.e.*, whether combings or clothing. Third, the amount of 'conditions' or the quantity of urine matter the wool will lose in scouring. This may be considered the most important part in connection with the classing of Merino flocks, for the simple reason, although the Merino breed has many varieties, those grown in the one locality will be more regular in type, therefore the quality of the wool does not play the same important part. It may, however, be noted that, regular as these type of sheep are in the flocks, those of the more robust constitution and bigger frame are somewhat coarser in quality than the bulk. Therefore in classing small Merino flocks of from 1,000 up, a distinction of quality is required. The basis of the work otherwise should be conducted upon the principle of 'condition.' Crossbred wools should be graded according to quality from 36's (which generally is represented by a Lincoln) up to 50's, the first count in crossbred Merino there is to be attained. There are counts as follows, representing as different kind of breeds. From a wool's standpoint, Lincoln is preferred to all other long-woolled breeds, owing to its possessing a longer staple in its fleece. Lincoln, also, when used for crossing purposes, will yield a heavier fleece, and one which will maintain its weight longer. It also possesses greater lustre, which is an important factor with crossbred wool of coarser description. Any crossbred wool up to 46's count should have good lustre. The Leicester has been largely used for producing crossbred wools from the Merino. It has been favored chiefly owing to early maturing qualities, and when mutton is required has a shapely carcass, but owing to the finer quality in wool than the Lincoln, has a shorter staple of fleece. Skirting is an important part in the preparation of wool for market, and should be done carefully. After the shearer has taken off the fleece, it is gathered up by taking each hindquarter and drawing it towards the body, and is then thrown out on a table tips uppermost. The table should be large enough to enable the skirter to spread the fleece out sufficiently for him to see clearly what he is doing. After the skirting is finished he should fold in the two sides and roll from both ends, thus having the shoulder wool on the outside of the fleece, which gives it an attractive appearance. Where flocks number under 300 sheep the skirting should be very light, taking off only the stained pieces and locks. Perhaps in this case the bellies may remain on the fleece. Where there are from 500 up to 1,000 sheep the skirting can be a little heavier, by taking off the lower trimmings and the short matted piece around the head, also any burry and seedy pieces. In this case pack the bellies separately from fleece wool. With 1,000 and over the skirting may again be a little deeper, and deep breech parts from hindquarters should be removed. These sections should again be sorted by removing lower trimmings. This will give two lines—first pieces and second pieces. The hairy sections down the breast may be removed; these should be put with the breech and branded first pieces. The two principle grades of wool are separated under two distinct headings—Merino and crossbred. All wools that range below 58's quality come under the term of crossbreds. Merino wools range upwards from 60's quality, and 58's is spoken of as bare 60's. Crossbred wools are graded into three different qualities—fine crossbred, which starts at 50's to 56's qualities: medium crossbred, from 44's to 50's qualities; coarse crossbred, 36's to 44's qualities. If the wool is classed under these different terms the woolbuyers have confidence in valuing it, thus better prices may be secured. Small flocks of under 300 sheep cannot be classed to any great extent, but care should be taken to get the wool up to the best advantage. The only classing practicable is to keep out any ragged or discolored fleeces, and keep Merino separate from crossbred. Where flocks number from 500 to 1,000 the classing can be carried out to better advantage. If the flock is mixed there will probably not be sufficient Merinos to make more than one class, but if it is necessary make three classes of crossbred—super crossbred, medium crossbred, and Lincoln. Keep out any heavy conditioned, matted, or broken fleeces. Rams' wool should be kept separate. These can be packed into bags, or put on top of some part bale and marked. In classing Merino flocks of from 1,000 to 2,000, three classes are recommended for fleece wool; these should be divided as follows:—A.A., the brightest, most attractive fleeces, having good regular length, and staple sound. A., those fleeces a little shorter, more irregular in length, and heavier in condition. C.C., the very short fatty, and heaviest

conditioned fleeces of all, usually found to have a black tip. Brand the bales neatly with stencil plates, the name of the property, the class of wool, and number the bales from one upwards. Brand on the flap end, and also on the seam side of the bale."

Longwood, October 11.

(Average annual rainfall, 37in. to 38in.)

PRESENT.—Messrs. Hughes (chair), J. Brown, E. Colley, H. Winter, J. C. Blakley, F. Hill, E. J. Oinn, E. A. Glyde, A. F. Furniss, J. R. Coles (Hon. Sec.), and two visitors.

DRAINAGE.—A paper on this subject was read by Mr. E. J. Oinn. He had been most successful in draining a peaty flat running down the centre of a gully, the sides being of a fine sandy loam nature, by cutting an open drain 18in. deep down one side with three or four similar drains diagonally across the gully towards the top. In these, lines of slabs, 6in. wide and 1½in. thick, were placed parallel to each other, about 4in, apart, with others, 9in. wide and 1½in. thick, placed along the top. This formed a culvert, 6in high by about 4in. wide. He had tried drains with a small stone culvert at the bottom, and a layer of rough stones on top, which silted up within 12 months; underground drains with straight saplings and bushes (which lasted for some time in land with a clay subsoil, but which were useless in sandy land) and other schemes. They were all unsuccessful, with the exception of the first-mentioned. In fairly flat country it was a good idea to plough the fields in 16ft. wide lands, separating each by a double-depth furrow. Drains in an orchard should run across the slope. Members thought 3ft. and 4ft. a better depth for drains. Where the surface consisted of fine sand it might be wise to place stones in the bottom of the drains, on these pipes, stones, brush or bushes, and then fill in the soil. Where stones were plentiful, they could be well got out of the way in this manner. Pipes were preferred by some, as they were easy to handle, involved less labor, and less difficulty was experienced in locating any stoppage that might occur. Mr. Oinn thought pipes unserviceable unless perforated.

Myponga, October 8.

PRESENT.—Messrs. G. Hunt (chair), G. Maslin, K. Stephenson, F. Pengilly, M. McGuinness, E. Everard, J. Müller, F. Müller (Hon. Sec.), and three visitors.

DRY BIBLE AND RICKETS IN DAIRY COWS.—The Chairman read a paper on this subject. The symptoms of dry bible in young cattle consisted of a cramped appearance of the chest and sides, and the ears drooping forward. If very bad the beast seldom lay down, and there was a tendency to chew bones, sticks, or leather. The first indication of the trouble in cows was a sudden cessation of the milk flow. Dryness of the nose, with rapid heartbeats, sometimes as high as 80 to the minute was also noticeable. The normal heartbeat was 47 or 48 per minute. The treatment advised was one bottle of linseed oil, in extreme cases, ¼lb. of carbonate of soda, one handful of salt in ½gall. of flour water, mixed well. With this the animal should be drenched every three of four hours. The flour water had the effect of softening the impaction, and he had given an animal as much as 5galls. of this in 48 hours without causing trouble. Cows on recovery showed a big increase in milk flow. Shortage of herbage was responsible for the trouble. With the promise of a dry season, it was advisable to grow maize, sorghum, or mangolds. In the case of rickets, the beast showed signs of stiffness, went down, appeared cramped in the back, as well as stiff in the joints. The trouble was due to the feed being too fresh or sloppy, or without substance. The animal should be drenched with salt and bonemeal, or moved to salt country. Members agreed that salt and bonemeal would prevent rickets, but considered them hardly suitable for a drench. Yacca poisoning was generally considered incurable when in the advanced stages.

Port Elliot, October 13.

(Average annual rainfall, 20·33in.)

PRESENT.—Messrs. J. Brown (chair), H. B. Welch, J. F. Vince, J. D. Gordon, H. Welch, J. Chibnall, H. Green, and W. E. Hargreaves (Hon. Sec.).

GRASSES AND FODDERS.—Some members thought Cape oats would do better and return more feed than grasses. They spoke well of prairie grass, but the stock ate it out by the roots. *Phalaris commutata* was one of the best grasses. It would grow through the winter on poor soil and would make good hay; it would also stand feeding down.

Potatoes.—Members recommended green manuring with oats or barley land intended for potatoes. They were divided in opinion as to whether it was advisable to apply manure before or at the time of planting the sets.

Rabbit Destruction.—Mr. J. D. Gordon had been very successful in destroying rabbits by ploughing furrows about 3in. deep and from 4in. to 6in. wide. Into these for two nights he placed apples for free feeding. Baits were then prepared by cutting apples into pieces an inch square, placing a layer of these in an old kerosine tin and dusting them with strychnine from an old pepper pot. On the third night the baits which needed to be fresh were placed in the furrow. It was advisable to have the paddocks clear of stock whilst poisoning, and all untouched baits and dead rabbits should be buried. He had picked up as many as 409 rabbits as the result of one night's poisoning in this way.

SOUTH-EAST DISTRICT

Keith, October 11.

(Average annual rainfall, 19·20in.)

Present.—Messrs. MacIntyre (chair), Makin, Redpath, Shannon, Morcom, and Lock (Hon. Sec.).

The Agricultural Bureau.—Mr. J. A. Lock read a paper, in which he said that the Agricultural Bureau had done a great deal to advance agriculture and horticulture in South Australia. The expressions of opinions and the exchanges of thought and experience at these meetings had done much in this direction. He expressed the view that the Government should make provision at Port Adelaide to enable any farmer so desiring to forward his wheat to that port to be shipped in bulk. Bags could then be returned to him and used for two or three seasons. The Bureau could urge on the Government the necessity for action in this regard. When a member took up residence in another district, it was advisable for him to transfer his membership to the Branch there, and thus secure the benefit of the experience of local farmers.

Kybybolite, September 30.

(Average annual rainfall, 22in.)

Present.—Messrs. A. Bradley (chair), W. J. Colebatch, B.Sc. (Agl.), M.R.C.V.S., H. Lacey, G. H. Hahn, P. Anderson, C. Hahn, A. Bradley, jun., E. W. Duffield, H. B. Schinckel, and E. C. Schinckel (Hon. Sec.)

Shearing.—Mr. H. B. Schinckel read a paper, from which the following is taken:—"The owner of a small flock, say some 300 or 400 sheep, would find it beneficial to have a shed, even if it does not contain all the modern conveniences of an up-to-date woolshed, through which he may shear his sheep under personal supervision. Most farmers have a machinery-shed, and without going to any very great expense a portion of this may be utilised for shearing. This, of course, may necessitate the removal of some of the implements, but as the shearing will probably last not longer than a week or so this short time will not be detrimental to those which are constructed principally of ironwork. A small section of grating may be put down temporarily to accommodate 30 or 40 sheep overnight, and with room for a shearing-board, which may also be temporary, table, and two or three bins, a space of about 20ft. square only is required. Hand-shearing is generally admitted to be the less severe on the sheep, both during the operation and after being put out in the paddock in extremely hot or cold weather. Furthermore, this method is much less costly, as all expenses, both primary and those incurred during shearing, are borne by the shearer; whereas with machines the cost of installing and upkeep is a pretty big item. Some time ago 6,000 sheep were shorn, 3,000 with shears and 3,000 with machines, and kept under exactly similar conditions. This was done for three years, and at the end of the term the hand-shorn sheep showed an increased clip of 1½lbs. per head. Probably the greatest points in favor of the machine are those of a quicker shearing and the obviation of the increasing difficulty of procuring hand-shearers. In a pen of machine-shorn sheep one invariably finds a big percentage of them badly pricked and cut, but with a capable man, who has a thorough knowledge of his machine, these painful scars need not be prevalent. It is contended by a great many small flock-owners that classing is not worth the candle, but this is a fabulous contention founded on a few lucky sales of some unprepared clips in the open market. I do not for one moment urge that the owner of a few hundred sheep should get his wool up into four or five classes unless, of course, he has that many distinct types of sheep, which at any time is a very unprofitable flock to have; but it is advisable, and I hope practicable with most of us, to make a line of four bales, showing uniformity in quality, character, and staple. If one has a few fleeces of other types of wool, keep them all separate, even if it is necessary to press them in the same bale to fill it, but acquaint the brokers of it. They will make a note in the buyer's catalogue, and he may then inspect and buy with confidence. As is the case in the preparation of all produce it is advisable to cater for the buyer."

Tintinara.

(Average annual rainfall, 18·78in.)

PRESENT.—Messrs. R. J. Gully (chair), J. Donaldson, Bell (3), Stead (2), J. E. Taylor, Kneale (2), R. K. Henderson, A. Koeppen Wendt, Baniger (2), C. M. Ives, C. P. Hodge, M. F. Hodge (Hon. Sec.).

FRUIT CULTURE.—The Horticultural Instructor (Mr. Geo. Quinn) delivered an address:—When setting out with the idea of planting an orchard in a new district, he said, one should try different varieties of fruits in the home garden first. This would give a very good idea in a few years what varieties of trees would do best and give the best commercial result. The position of the house very often governed the site for the garden, and as a high site was usually selected for the house, this, unless the rainfall was plentiful, was not a suitable place for a fruit garden. Taking this district as an instance, where the rainfall was about 20in., he suggested that they should choose the lowest ground for the orchard. They should examine this soil in February and March to see whether it contained sufficient moisture to carry the fruit tree through the summer. In average districts moisture was not more important than shelter, either natural or artificial. Where they were without good natural shelter for their fruit trees they would find it necessary to provide shelter. He suggested Tamarisk as the best and quickest growing for sandy soil. They should be planted early and closely together to provide a dense breakwind. The Aleppo Pine also made a good shelter, but he suggested growing them from seed or in plots during the first season so that they could be set out earlier than if procured from the Forest Department. This pine did much better if set out earlier in the season, say April and May, with the first rains. *Pinus insignis* would also thrive well and should hold out in this locality. The Upright Poplar (Lombardy poplar) should also do well. In Port Adelaide district right on the white sand this tree was doing remarkably well. The trees should be planted closely together. He strongly advocated planting trees around the house, and where there was natural timber scattered about he advised filling in as much as possible. He obtained the best results from Tamarisk, putting in cuttings 12in. to 18in. long and leaving about 1in. out of the ground. It did well in sand and thrived on a limited amount of moisture The orchard should be netted in with 1¼in. mesh netting before the trees were planted, otherwise the rabbits would ringbark them. Preparation of the soil was more important at the outset than when dealing with the land for a wheat crop. It was necessary to break the ground as deeply as possible, keeping the top soil in its natural position without inverting the clay. This could be done either with the disc plough or the subsoiler. The soil with the clay close in this district would eventually give the best results. The whole of the area to be planted should be ploughed 12 months ahead and cleaned free of all roots. Native plants were attacked by fungi which would transfer themselves to the fruit trees, as had happened on new land at Crafers. He had tried growing trees in pots, and planted them out early in the season, and found that by doing so they made a fine supply of roots. When planted in midwinter the roots remained dormant, and if a dry summer were experienced the trees might have a very hard struggle to get through. When planted later the tree started to make root at the same time that it came into bud, and therefore the top soon received a check. He therefore advised planting while the ground was still warm, so that the roots started growing before the top of the tree. It was the usual practice to plant the trees to the same depth as they were in the nursery, with the exception of citrus trees, as raising or lowering a deciduous tree 1in. would not make any difference to its growth. The hole for the tree should be 2ft.

quare at the top, with the sides sloping outwards. The top portion of the soil should be taken out with the spade and the bottom barred or forked up well, leaving it nice and loose. Each vine or tree should have a cup full of bonedust. It was much better to make the hole fit the roots than the roots to fit the hole. They should be spread well out in the hole. When putting the soil on to the roots do not put any fermentable matter on top of them. Cover them well with fine soil and hold the tree upright and compact the soil around the roots with the feet, then fill in the hole to a level with the surface. There were three systems of planting—Square, rectangular, and septuple. He advised the square system. They could then work the land at right angles and thus keep it well worked down. When planting young trees they should give attention to their immediate surroundings and dig 6ft. square around each. When taken from the nursery the roots were probably cut straight off so that it became necessary as the roots were curtailed to do the same with the top. It was also advisable to shape the trees. Trees taken from the nursery should represent one year's growth. They should be cut right back to the height of stem required, the laterals being cut back to the base buds. An evenly balanced tree was secured by, in the summer, just nipping the top out of the strong growing shoots to help the weaker shoots. Any pruning done in the winter time tended to cause increased wood and leaf growth. When done in the summer it tended to produce fruit-bearing small wood. In the northern part of this State, where the soil was heavier, the best results had been obtained by breaking up the land deeply in the early winter, ploughing away from the trees, and in the spring ploughing back to the trees to a shallow depth. In wet districts it was best to plough once and then put the scarifiers through and keep the orchard clean. Where matured trees were over vigorous and not fruiting well they should be given less tillage and practically no winter pruning. The pests of the fruit tree were confined to the insect family and fungi. The insects were divided into two families—suckers and chewers. The former were got rid of by spraying over them kerosine wash, tobacco, &c.; the chewing or gnawing section by poisoning their food with arsenate of lead or other poisons. The fungus pests were either external or internal in their occurrence on the host plant. The external kinds might be destroyed when their presence was seen by using dustings of sulphur or copper sprays. Those entering the tissues must be treated in a preventive fashion before their ravages were visible. This usually took the form of spraying the trees with Bordeaux mixture or other copper compounds just as the flower buds were opening.

Wirrega, October 4.

(Average annual rainfall, 19in. to 20in.)

Present.—Messrs. H. Exton (chair), F. and L. Densley, C. and F. Meier, J. Green, L. Pitman, W. Fairweather, R. Williams, and L. Cook (Hon. Sec.).

Disc and Mouldboard Ploughs.—In a paper on this subject Mr. L. Densley said that for use in new mallee country where there were numerous stumps and shoots, and the soil had a tendency to sourness, he preferred the mouldboard plough. There was generally a difficulty in securing sufficient stubble to carry a fire, however, and there the disc implement was very useful. It turned the stubble nicely under and did not foul so much as the mouldboard. It was lighter on the horses, and whilst it did not pull out so many stumps as the mouldboard implement, it did excellent work among broom roots, especially if the latter had been through the ground previously. The expenditure on repairs, however, was comparatively heavy. It left the sandy soil, which was very sour, too smooth for fallow. The mouldboard left it rougher, and consequently a greater surface was exposed to the sun and air. It also pulled out a great many stumps and weakened those that remained. The disc cultivator did good work in destroying shoots at seeding time.

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T. PASCOE,
Minister of Agriculture.

POINTS FOR PRODUCERS.

Kybybolite Experimental Farm.

Farmers' Day at Kybybolite Farm, in view of the many problems being worked out by Mr. Colebatch (Superintendent of Agriculture in the South-East), is an event which is always looked forward to by agriculturists in that and surrounding districts. At the invitation of the Minister of Agriculture (Hon. T. Pascoe, M.L.C.) about 130 members of the Bureau and a number of visitors attended this year's inspection of the farm, which was held on Friday, November 21st. In addition to the Minister, those present included the Hon. J. Cowan, M.L.C., Mr. Bodey, M.P., Representatives Livingston (South Australia) and Stumm (Queensland), Messrs. G. R. Laffer and F. Coleman (of the Advisory Board of Agriculture), and the Secretary to the Minister (Mr. W. L. Summers). With his usual forethought, Mr. Colebatch had distributed printed pamphlets setting out briefly the principal features of the work carried out during the 12 months, and this proved of great advantage to the visitors, who spent an interesting time inspecting the crops, stock, buildings, &c. During the day a convincing demonstration of the value of explosives in removing large timber was given. A heavy charge of rendrock was inserted (in seven holes) beneath an immense red gum, which had a diameter of 5ft. at the base. The explosive, which was fired with electricity, completely lifted the tree out of the ground. It was considered that the removal of the tree in the ordinary way would have taken two men a couple of days. At the conclusion of the inspection a number of speeches were delivered, the Minister and others expressing their high appreciation of the enthusiasm of Mr. Colebatch and his assistants, and of the value of the work being done at the farm.

Show of S.A. Produce in England.

Writing with reference to the display of South Australian produce at the London Grocers' Exhibition, which was held at Islington from September 20th to September 27th inclusive, the Trade Commissioner states :—" In addition to the ordinary daily papers, the South Australian exhibit received the special attention of practically all the trade papers of any note in the United Kingdom. The following is an extract from *The Grocer* (one of the leading organs of the grocery trade), and the other papers are practically all of the same opinion in regard to the South Australian exhibit :—' Of the number of colonial displays in the exhibition that of the South Australian Government was undoubtedly the most comprehensive and practical, and great credit is due to Major A. E. M. Norton, the Trade Commissioner for

South Australia, who was responsible for the exhibit. Among the produce shown was an excellent range of wines, including the following brands of burgundies :—Tintara, Harvest, Emu, Keystone, Orion, and Victoria. A splendid assortment of dried and bottled fruits was on view, and our attention was drawn to samples of new season's currants, which have arrived in the pink of condition. South Australian honey in glass jars bulked very largely in the display. It is a pure product, and each jar bears a Government label with a guarantee of purity. Tomato sauce, tinned meats, eucalyptus oil, wheat, and other products of the colony went to make up an attractive exhibit ; nor must we omit reference to the fresh apples and pears on show, which are of excellent appearance and quality, and the sale of which is steadily increasing. The exhibit was a real live display, as everything that was shown can be obtained from those wholesale houses who have taken up agencies for the sale of South Australian products.' "

Action of Lime.

It is said that farmers as a class are rather neglecting the use of lime ; they are depending too much on chemical manures, and omitting to give the soil dressings of such a necessary constituent as lime. If so, this is a matter of regret, because the crops will suffer in health and quality. Some chemical manures, such as sulphate of ammonia and kainit, use up the lime in the soil, and all fertilisers, by increasing the crop, increase also the consumption of lime. It is, therefore, the part of a good farmer to see that the soil of his farm is well supplied. The action of lime hastens the decay of vegetable matter and sweetens sour lands which may have been more or less submerged. It increases the capillary condition of soil, prevents fungoid diseases, and promotes the growth of more nutritive herbage in pastures ; it also decomposes minerals in the soil containing potash and other food constituents, and renders them available for the needs of the plants. Further, it decomposes organic matter and promotes the important process which is so much in evidence at present—" nitrification." Thus, to sum up, lime may be said to have a mechanical, chemical, and biological action, and the importance of a systematic application of this invaluable soil improver and fertiliser to lands which are at present in lack of it should be apparent to all agriculturists. When this need is supplied, many of the ailments from which stock suffer, and often caused from lack of this very necessary substance in plant food, will be avoided. Acidity of the stomach, so frequently met with amongst cattle, is attributable to want of alkaline matter in the food supply. Malformations at birth, particularly with foals and lambs, can also be traced to the same cause. The anæmic condition, often noticeable amongst cattle which have been pastured for any lengthened period on light country, has the same origin.—*Mark Lane Express.*

Victorian Harvest.

According to a telegram appearing in the press, the Victorian Railway Commissioners estimate the coming wheat harvest of that State at 37,000,000bush. The 1910-11 harvest, which was a record, totalled 34,000,000bush.

Potatoes as a Food for Pigs.

These experiments were designed to test the value of potatoes as compared with maize as the principal food in the rations fed to pigs. The basal ration was fixed and the animals given as much potatoes and maize as they would eat. The 43 pigs used were of the improved German breed, about 44lbs. in weight and 12 weeks old, the object being to fatten them to a slaughter weight of about 240lbs. in five months. The amounts of food consumed, the increases in live weight, and the profit in 22 weeks will be seen from the following table :—

	Lot 1 (11 Pigs) Average per Pig.	Lot 2 (11 Pigs) Average per Pig.	Lot 3 (11 Pigs) Average per Pig.	Lot 4 (10 Pigs) Average per Pig.
	lbs.	lbs.	lbs.	lbs.
Foods consumed—				
Fishmeal	25½	25½	25½	25½
Gram	335	335	335	335
Rye chaff	—	—	10½	80
Meatmeal	—	—	—	19
Maize	377	—	—	—
Potatoes	—	1,479	1,581	1,389
Increase in live weight	187	168	188	189
Profit (*i.e.*, value of increase less cost of food consumed)	27s. 11d.	24s. 1d.	31s. 3d.	32s.

The value of the increased live weight was reckoned at 5·4d. per lb., and the costs of the foods as follows (per lb.) :—Maize, 0·9d. ; gram, 1d. ; fishmeal, 1·4d. ; meatmeal, 1·7d. ; rye chaff, 0·1d. ; and potatoes, 0·18d.—*Journal of Board of Agriculture.*

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New Views on Feeding Livestock.

In the past few years views as to the fattening of livestock have been changing, and the opinion has gained ground that too much importance has been and can be attached to the nitrogenous part of the ration. There is a danger, perhaps, that too much weight may now be attached to starchy foods as the pendulum slowly swings round, as it is in this direction that we are now told lies economy and wisdom. Certainly a perusal of the results of the many feeding experiments which have been conducted for many years past suggests that the importance of nitrogenous food as against starchy has been over-estimated, and that the pockets of farmers have suffered in consequence. Many figures, in fact, show good results from a much wider albuminoid ratio than was formerly allowed to be necessary, as good in some cases as much narrower ones, and this must mean, as a rule, less expenditure in food. A most significant point in this connection is the high value which is now found to lie in some kinds of mineral manuring as compared with manure produced by expensive feeding, the latter being formerly supposed to be a more important set-off to the expense of feeding than is now known to be the case. If 1lb. of protein will fatten stock as well as double this amount, there is little sense, surely, in buying the larger quantity at present high prices, whatever the value of the manure; and yet this is what some farmers still persist in doing. But the question is not nearly so simple as it seems, and our knowledge is as yet so imperfect, owing to absence of research on feeding-stuffs, that feeding by rule is not a safe guide, and practical men are sometimes nearer the mark than their scientific advisers.—*Livestock Journal.*

Encouraging the Farmer.

A progressive West Virginia breeder, says *The American Agriculturist*, has offered eight Ayrshire bull calves as prizes to farmers of Ohio and Brooks counties; two each for the erection of the first two silos, the best acres of alfalfa, the best year's record of milk and butter-fat tests, and the best prepared record of farm accounting. Here is a progressive idea which shows also abundant faith in farming. Surely it will have a good effect in its locality. Why not adopt it, or a modification of it, in other sections?

Cows Holding up Milk.

It is quite common to find cows that have the bad habit of holding up their milk—a thing that is hard to overcome unless a person knows just how to go about it. There is always a definite reason for it, however, as a cow that has everything to please her physically and mentally will be very unlikely to hold up her milk, and a cow that holds up her milk and is put in physical and mental comfort will quite probably give it down again. *Farm and Home* (England) discusses this subject briefly in a way that gives some interesting pointers to persons dairying anywhere, and says—"Cows are often 'difficult' in regard to giving down their milk perfectly in the height of the milking season. They fall into the habit in the flush of feed from tenderness of the udder, especially if the spaces between milkings are unequal, so that at one of them the bag becomes very much overstrained and painful. The bag thus becomes inflamed, swollen, and hard, and withholding the milk or any part of it tends to increase the difficulty. From an unequal division of time between milking, some cows habitually hold up their milk at night and give it down in the morning. The habit once being formed there is no sure cure for it. The same treatment will not work alike on different cows. As a rule, cows give down best in a few minutes after they first come into the stable or yard without having any food before them or anything to attract attention or disturb them, but some will give their milk more freely if eating something that they relish well, so that their attention is more taken up with the food than the milking. Regular, evenly timed, quick, quiet, and comfortable milking is essential, and the best means both for preventing and for breaking up the bad habit in cows of holding up their milk."

Coconut Fat for Rearing Calves.

In the *Bulletin of Agricultural Intelligence and Plant Diseases*, February 1913, results are given by Dr. Paul Schupple of experiments carried out for eight years in which coconut fat was used as a substitute in rearing calves for butter-fat. This substance contains 99 per cent. of pure fat, and is the cheapest vegetable fat obtainable. The fat and skim milk were used in the proprotion of 35 grains of fat to 1 litre of milk (5½ozs. to the gallon), heated to 60°C. and passed through an emulsion drum. A milk containing 3½ per cent. of fat was thus obtained at a cost of 4½d. per gallon. For satisfactory results the milk must be made fresh each time. It was found that calves could be reared much more economically on emulsion milk than on a mixture of whole and skim milk, and that there was no difference in the final weight of calves reared according to these two systems.

Imports and Export of Fruits, Plants, Etc.

During the month of November, 1913, 2,838bush. of fresh fruits, 10,420bush. of bananas, 2,904 bags of potatoes, 566 bags of onions, and 38pkgs. of trees, plants, bulbs, &c., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910; 2pkgs. of plants and 176bush. of bananas were destroyed (over-ripe). Under the Federal Commerce Act, 314 cases of fresh fruits, 400pkgs. of honey, 651pkgs. of dried fruit, 36pkgs. of preserved fruit, and 1pkg. of seeds were exported to oversea markets during the same period. These were distributed as follows:—For London, 400pkgs. of honey and 1pkg. of dried fruit; for Canada, 375pkgs. of dried fruit; for South Africa, 275pkgs. of dried fruit; for India and the East, 36pkgs. of preserved fruit; for Cyprus, 1pkg. of seeds; for New Zealand, 205 cases of oranges, 103 cases of lemons, and 6 cases of cherries. Under the Federal Quarantine Act, 8,645 cases of dates, 175pkgs. of dried figs, and 1,847pkgs. of plants, bulbs, seeds, nuts, &c., were examined and admitted from oversea markets.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. Place, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

"W. C.," Mount Compass, wants advice regarding a heifer which has irregular cud and appetite after calving, shivers and is stiff, weak, and tucked up, improves in a few days.

Reply—The symptoms point to inflammation of the womb. The advice you had to give nux vomica was sound, and if there is a repetition of the symptoms, 10 drops of the tincture, alternated with a similar quantity of tr. pulsatilla in a little water twice daily, will be followed by improvement.

The Morphett Vale Branch Agricultural Bureau, asks the earliest age advisable for castration of colts.

Reply—There is no objection to castration at a few weeks old, while sucking, when the testicles are in the purse ; however, it is more usual to operate on yearlings, when the glands are more developed.

HORTICULTURE.

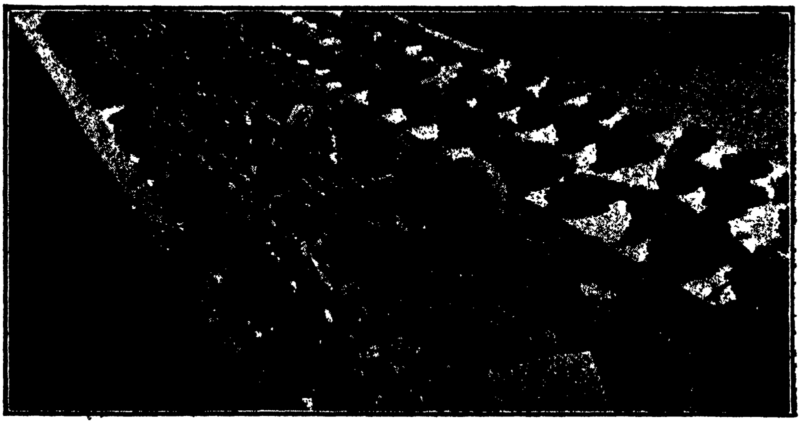
(Replies supplied by Mr. G. Quinn, Horticultural Expert.)

"A. C. I.," Port Pirie, has some orange and mulberry trees which are covered with small black ants. He asks if they affect the growth of the trees.

Reply—The continued presence of black ants on fruit trees is usually an indication that some suctorial insect—scale or aphis—is present upon it, giving rise to the sweet honey dew upon which the ants feed. It is possible this is so in your case, and you are advised to examine the twigs and bark closely for the presence of one, or perhaps both these pests. The aphides prefer the tender tips, the scales are usually found upon the leaves—often alongside the midribs—and upon the bark of the younger parts. The remedy is to spray the trees with kerosene emulsion or resin wash. If there is a sooty coating upon the leaves or twigs this is evidence of the presence or recent visitations of these insects.

"T. H. M.," Clare, forwards samples of twigs of currant and sultana vines which he believes are affected with anthracnose. He asks if his supposition is correct, and for advice as to treatment. Other correspondents have forwarded vine cuttings similarly affected.

Reply.—The disease attacking twigs of currant and vines is, as you surmise, the anthracnose, or black spot of the grapevine (*Sphaceloma ampelinum*, De Bary). The only remedy to my knowledge which proves a check upon this fungus after the leaves start is Bordeaux mixture, and I advise you to give the plants a thorough drenching with same at once; after which, if the season turns normal, you may yet secure a fair return of sound fruit and wood growth for next year. After pruning and promptly burning the prunings next winter, I advise you to swab the spurs and canes with a saturated solution of iron sulphate with sulphuric acid as follows:—50lbs. iron sulphate, 10galls. hot water, 1 pint sulphuric acid (commercial). Using a wooden vessel, pour the acid over the iron crystals, and then stir in the boiling water. This mixture will injure the clothing or the skin, so precautions should be taken to protect the face and hands. This remedy is relied upon in Europe and North America. If the summer continues to prove showery, I advise you keep the vines fairly open to sunlight, as allowing the foliage to dry rapidly is a great help in the suppression of the anthracnose and other fungus diseases. We have used Bordeaux mixture, prepared according to the Woburn formula, against curl leaf fungus with success, and it goes through the pump without any clogging of valves or nozzles.



Fruit Exhibit, Adelaide Show.

WHEAT PRODUCTION OF THE FUTURE.

THE WORLD'S NEED AND SUPPLY.

Of the many important questions now engaging the attention of scientists, there are few of more absorbing interest than that relating to the future wheat supply and requirements of the world. Since Sir William Crookes, in 1898, made his oft-quoted pronouncement, the contributions to this subject have been many and varied. One of the latest and most weighty is contained in the address delivered at the recent meeting at Birmingham of the British Association for the Advancement of Science by Professor H. N. Dickson, President of the Geographical Section. The address is printed *in extenso* in the October number of *Nature*, and from that journal the following extract is taken :—

In his presidential address (said Professor Dickson) to the British Association at its meeting at Bristol in 1898, Sir William Crookes gave some valuable estimates of the world's supply of wheat, which, as he pointed out, is "the most sustaining food-grain of the great Caucasian race." Founding upon these estimates, he made a forecast of the relations between the probable rates of increase of supply and demand, and concluded that "Should all the wheat-growing countries add to their (producing) area to the utmost capacity, on the most careful calculation the yield would give us only an addition of some 100,000,000 acres, supplying, at the average world-yield of 12·7bush. to the acre, 1,270,000,000bush., just enough to supply the increase of population among bread-eaters till the year 1931." The president then added, "Thirty years is but a day in the life of a nation. Those present who may attend the meeting of the British Association 30 years hence will judge how far my forecasts are justified."

Half the allotted span has now elapsed, and it may be useful to inquire how things are going. Fortunately this can be easily done, up to a certain point at any rate, by reference to a paper published recently by Dr. J. F. Unstead (*Geographical Journal*, August, 1913), in which comparisons are given for the decades 1881-90, 1891-1900, and 1901-10. Dr. Unstead shows that the total wheat harvest for the world may be estimated at 2,258 million bushels for the first of these periods, 2,575 millions for the second, and 3,233 millions for the third, increases of 14 per cent. and 25 per cent. respectively. He points out that the increases were due "mainly to an increased acreage," the areas being 192, 211, and 242 million acres, but also "to some extent (about 8 per cent.) to an increased average yield per acre, for while in the first two periods this was 12bush., in the third period it rose to 13bush. per acre."

If we take the period 1891-1900, as nearly corresponding to Sir William Crookes's initial date, we find that the succeeding period shows an increase of 658 million bushels, or about half the estimated increase required by 1931, and that attained chiefly by "increased acreage."

But signs are not wanting that increase in this way will not go on indefinitely. We note (also from Dr. Unstead's paper) that in the two later periods the percentage of total wheat produced which was exported from the United States fell from 32 to 19, the yield per acre showing an increase meanwhile to 14bush. In the Russian Empire the percentage fell from 26 to 23, and only in the youngest of the new countries—Canada, Australia, the Argentine—do we find large proportional increases. Again, it is significant that in the United Kingdom, which is, and always has been, the most sensitive of all wheat-producing countries to variations in the floating supply, the *rate* of falling-off of home production shows marked if irregular diminution.

Looking at it in another way, we find (still from Dr. Unstead's figures) that the total amount sent out by the great exporting countries averaged, in 1881-90, 295 million bushels; 1891-1900, 402 millions; 1901-10, 532 millions. These quantities represent respectively 13·0, 15·6, and 16·1 per cent. of the total production, and it would appear that the percentage available for export from these regions is, for the time at least, approaching its limit, *i.e.*, that only about one-sixth of the wheat produced is available from surpluses in the regions of production for making good deficiencies elsewhere.

There is, on the other hand, abundant evidence that improved agriculture is beginning to raise the yield per acre over a large part of the producing area. Between the periods 1881-90 and 1901-10 the average in the United States rose from 12bush. to 14bush.; in Russia from 8bush. to 10bush.; in Australia from 8bush. to 10bush. It is likely that, in these last two cases at least, a part of the increase is due merely to more active occupation of fresh lands as well as to use of more suitable varieties of seed, and the effect of improvements in methods of cultivation alone is more apparent in the older countries. During the same period the average yield increased in the United Kingdom from 28bush. to 32bush., in France from 17bush. to 20bush., Holland 27bush. to 33bush., Belgium 30bush. to 35bush., and it is most marked in the German Empire, for which the figures are 19bush. and 29bush.

In another important paper (*Geographical Journal*, April and May, 1912) Dr. Unstead has shown that the production of wheat in North America may still, in all likelihood, be very largely increased by merely increasing the area under cultivation, and the reasoning by which he justifies this conclusion certainly holds good over large districts elsewhere. It is of course impossible, in the present crude state of our knowledge of our own planet, to form any accurate estimate of the area which may, by the use of suitable seeds or otherwise, become available for extensive cultivation. But I think it is clear that the available proportion of the total supply from "extensive" sources has reached, or almost reached, its maximum, and that we must depend more and more upon intensive farming, with its greater demands for labor.

The average total area under wheat is estimated by Dr. Unstead as 192 million acres for 1881-90, 211 million acres for 1891-1900, and 242 million acres for 1901-10. Making the guess, for we can make nothing better, that this area may be increased to 300 million acres, and that under ordinary agriculture the average yield may eventually be increased to 20bush. over the whole, we get an average harvest of 6,000 million bushels of wheat. The average wheat-eater consumes, according to Sir William Crookes's figures, about 4½bush. per annum; but the amount tends to increase. It is as much (according to Dr. Unstead) as 6bush. in the United Kingdom and 8bush. in France. Let us take the British figure, and it appears that on a liberal estimate the earth may in the end be able to feed permanently 1,000 million wheat-eaters. If prophecies based on population statistics are trustworthy, the crisis will be upon us before the end of this century. After that we must either depend upon some substitute to reduce the consumption per head of the staple foodstuff, or we must take to intensive farming of the most strenuous sort, absorbing enormous quantities of labor and introducing, sooner or later, serious difficulties connected with plant-food. We leave the possibility of diminishing the rate of increase in the number of bread-eaters out of account for the moment.

We gather, then, that the estimates formed in 1898 are in the main correct, and the wheat problem must become one of urgency at no distant date, although actual shortage of food is a long way off. What is of more immediate significance to the geographer is the element of change, of return to earlier conditions, which is emerging even at the present time. If we admit, as I think we must do, that the days of increase of extensive farming on new land are drawing to a close, then we admit that the assignment of special areas for the production of the food supply of other distant areas is also coming to its end. The opening up of such areas, in which a sparse population produces food in quantities largely in excess of its own needs, has been the characteristic of our time, but it must give place to a more uniform distribution of things, tending always to the condition of a moderately dense population, more uniformly distributed over large areas, capable of providing the increased labor necessary for the higher type of cultivation, and self-supporting in respect of grain-food at least. We observe in passing that the colonial system of our time only became possible on the large scale with the invention of the steam locomotive, and that the introduction of railway systems in the appropriate regions, and the first tapping of nearly all such regions on the globe, has taken less than a century.

VINEYARD AND ORCHARD LAND.

THE USE OF EXPLOSIVES.

By H. E. Laffer, Lecturer in Viticulture and Fruit Culture, Roseworthy Agricultural College.

Much has been heard recently of the efficacy of explosives for the purpose of subsoiling, and, although a considerable amount of work has been done in this connection, there can be no doubt that much has yet to be learned before the practice becomes general. Take, for instance, vineyard lands, where the thorough breaking of the subsoil is of such vital importance to the welfare of the vines. We have on the one hand to refer to new vineyards in the course of planting, and on the other to the improvement of conditions in those vineyards or orchards which have been established for some years.

It must be admitted that throughout Australia the preparation of our vineyard or orchard lands prior to planting has in the past left much to be desired, and it is now a question as to whether these soils can be profitably and effectively treated to remedy the defects of insufficient preparation.

New Land.

In the first case I doubt if the subsoiling with explosives can be so effectively or economically carried out as it can be with teams and ordinary implements used for the purpose. That is to say, by usual subsoiling practices a more uniform broken layer of soil will be obtained to a depth of 18in. to 24in., according to the strength of implements and teams. Such a preparation, and one which appears to be essential in a great deal of our vineyard areas, may at a glance seem unnecessarily costly, and may be put down at £4 to £6 per acre. It must be remembered, however, that the average life of a vineyard may be taken as from 35 to 40 years, and therefore, in comparison with the increased vigor and yields distributed over this period, the cost may be looked upon as comparatively small.

The necessity for such a preparation, as well as the cost and the completeness with which it can be carried out, depends very largely upon the nature of the soil under consideration. Also it must be remembered that those soils most expensive to subsoil are the ones most needing the treatment. In loose, open, gravelly, or alluvial soils, costly subsoiling can be dispensed with, as the roots experience no difficulty in penetrating deep into the lower layers. Then there is the type of land with a surface crust—may be of clay or limestone—in which it becomes necessary to break this crust by a comparatively shallow subsoiling. Finally, there is the hard tough soil which needs thorough breaking for a depth of 18in. to 24in. In carrying out the work one has the usual implements, consisting of an ordinary strong single-furrow plough, which can be worked to a depth of 12in. or more, and, in addition, the goose-necked American subsoiler to follow behind the plough. The disadvantage of this system is that it tends to break the subsoil into ridges, and thus a second working at right angles to the first is an additional advantage.

A USEFUL IMPLEMENT.

For a more general working, and one which dispenses with the necessity of two implements, there is a plough little known in South Australia. This is the English ditching plough, which is designed to cut a furrow 20in. deep and 20in. wide. I have worked this implement, cutting a furrow 16in. wide and 20in. deep, and for soil not too stiff, consider it more economical than the combined plough and subsoiler. It is certainly quicker, and has the advantage of creating a more uniform mass of loose soil. Owing to its construction it is free from the objection of bringing the clay to the surface, and the greater the depth in proportion to the width of furrow the less does this objection become.

To work the plough to this depth will need a team of eight good horses; but that is no more than it would take to do similar work with the subsoiler and plough. In any case, whatever system is adopted, the result of subsoiling is to create a depth of broken soil into which the young roots easily spread and which absorbs and retains a large quantity of moisture.

Now to compare this treatment with similar work done by explosives.

To anyone who has observed the effect of explosives on a soil, it would appear that, though one may get a deeper preparation, it cannot be so even in its nature as that done by the plough and subsoiler. To a great extent the soil is broken in a more or less local position around the seat of the charge or shot. The efficiency of the work done by explosives is entirely dependent upon the physical condition of the soil at the time of operation; for, unless it is comparatively dry and readily broken into fragments, the effect of the explosion is to drive it into an even more compact condition, with an almost water-tight cavity at the bottom. Even assuming that the soil is in a condition to give the best results, if anything like uniformity of preparation is to be obtained the shots must be fired at comparatively close intervals. This necessitates a large number of shots per acre, and even allowing that the most economical means of charging and firing the holes is adopted, the cost must be very considerable.

Assuming the cost of one plug of gelignite with necessary fuse and detonator to be 2½d., add to this the cost of boring and charging the hole, and I think that 4d. is the very lowest estimate at which it can be placed. Now we have to consider the number of shots per acre required to give a good uniform breaking of the soil and subsoil; and if anything equivalent to subsoiling is to be obtained, I consider one charge equal to 4 sq. yds. of surface. That is 1,210 shots to the acre, or a cost of £20.

So far as my own experience goes, I find that results vary exceedingly in soils of different physical natures. Clay soils, if too damp, will lift right out, throwing up the earth to form a cavity below, and accompanied by a certain amount of surface breakage. The same soil dry will shatter considerably below, with but little surface effect until the winter rains fall. The results will then be seen in a slight subsidence of the soil for a considerable area and defined by surface cracks. In the deeper soils, especially if somewhat gravelly with a fairly compact surface, the results of the explosions are very contradictory, and in such a soil I have seen a charge of gelignite up to four plugs make scarcely any surface impression. The explanation of this will probably be found in the fact that the more or less loose nature of the subsoil absorbed the shock of the explosion. Exactly similar results followed where a thin crust of limestone overlaid a marly subsoil, and beyond the burnt fuse appearing at the surface there was no evidence of explosion of even three plugs of gelignite.

Taking all these facts into consideration it may be assumed that for general subsoiling the use of explosives is not comparable to that of team work.

PLANTED LAND.

We have next to consider the improvement of soil conditions in an established vineyard or orchard.

It is a common experience to find vineyards which have been planted with no general preparation beyond ploughing 9in. to 12in. deep. I refer to vineyards particularly because a great number of these are in what may be classed as the better agricultural areas, where the subsoil is frequently tough and compact. Orchard lands purely we find are more confined to the deeper and alluvial soils.

It is true that a good hole is opened out where the vine is to be planted, but at the most this allows but a limited scope for root development. As a result, after a few years of active growth, the vines or trees settle down to a stunted condition, and in districts where rainfall is deficient and heat proportionately severe, the trees suffer from "die back," and are short lived. Vines, though exhibiting great hardiness and adaptability, also suffer in both their growth and fruit production. If, however, this soil had been well broken up, giving the plants a wider range for root development, the conditions would more nearly resemble those of the looser soils in the better districts. It is in this connection, I think, that explosives will be found to work at their best advantage.

In an established vineyard we are faced with the impossibility of working a big subsoiler team within the narrow rows, and although to a certain extent the same difficulty is not experienced in an orchard, yet the work done is limited to a central strip between the rows. The breaking of this strip of soil is certainly to be recommended, but what is more necessary is to get closer to the trees without doing unnecessary injury to the existing root system.

The plan I have adopted is to put from four to six charges around old trees, keeping about 6ft. out from the stem. The holes are put down 2ft. deep, and the charge consists of one to one and a half plugs of gelignite. This work should be done in the autumn after the fruit has been gathered, and represents a period when, in normal seasons, the ground is most likely to shatter readily. When in this condition there is a distinct general lift of the soil without much surface breakage, and when the winter rains fall the affected area is marked by a general subsidence of the surface, indicated by cracks which may range from a diameter of 15ft. to 20ft. There is bound to be more or less of a cavity produced by the explosion, and ultimately this becomes filled with surface soil which may reasonably be expected to distribute itself through the larger fissures in the subsoil. This fact alone must be of advantage to the trees, placing at the disposal of the roots a quantity of rich surface soil. Another possibility arises from the results of this practice, and that is the introduction into the explosion cavity of some manure such as bonedust or superphosphate, which materially overcomes the difficulty of placing these manures within easy reach of the roots.

From personal observation I am of the opinion that old trees which have become stunted under conditions such as have been described, but which are otherwise healthy, will derive considerable benefit from this treatment, even without the addition of manure.

In dealing with a vineyard it is not to be expected that results equal to subsoiling could be obtained; but even so, much good will, I think, follow from even a limited use of explosives. Take as an example a vineyard planted 10ft. by 7ft. Place charges up the centre of the rows and at the intersections of the cross lines from the corners of the 10ft. by 7ft. parallelograms. Roughly, this means that one shot affects 8 sq. yds. of soil, or a total cost of £10 per acre on the basis of the figures already given. In actual practice over an area this cost might be reduced.

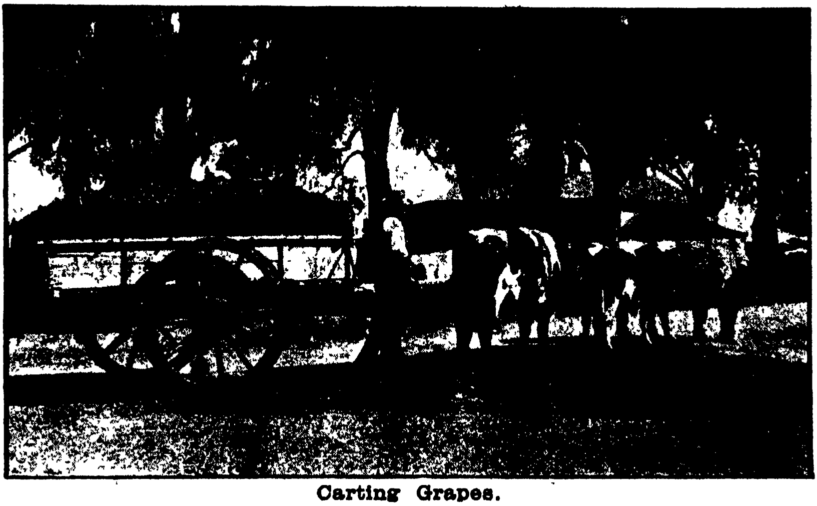
In the absence of definite data it is only reasonable to assume that benefit to the vines must result, and the value of increased returns would soon recover the extra amount of capital involved.

Finally, there is the question of planting young trees where total subsoiling is, for various reasons, impossible ; such as the filling of blank spaces in an orchard. The difficulty of filling a blank where the soil has become impoverished by a previous tree is well known, and to overcome this a loose soil for free root development is essential, and in this respect explosives answer very well. A plan to be recommended in such a circumstance is to put down three holes on a 4ft. or 5ft. triangle, the centre of which is the spot to be occupied by the tree. Use for each hole one to one and a half plugs of gelignite, and fire simultaneously. Afterwards the necessary hole can easily be taken out by a spade or fork.

The advantage of three holes over one central one is, in the first place, that a greater area of soil is broken up and there is no central cavity to subside afterwards and take the tree down with it. The young tree is, in a sense, planted upon a pyramid of loose earth caused by the explosions and all around it are fissures and cavities which fill with fine soil and into which the roots easily lead.

GELIGNITE.

In the selection of explosives one has a choice of several, but probab'y that of greatest convenience and utility is gelignite. It is maintained by some that this explosive is too sharp or quick in its combustion, and for some soils a slower explosion gives best results. It must never be forgotten that there is the element of danger associated with these explosives of high power, but given reasonable precautions, there is no more danger than in handling a tin of benzine. Nobel's gelignite is sold in 5lb. boxes, 50 plugs to the box. Proper implements are obtainable for cutting fuse and crimping on the detonators, and the man who does this latter with his teeth is taking a quite unnecessary risk. Want of care in fixing the detonator is often responsible for a miss-fire, such as failing to shake out the sawdust packing. In this case it is best to place a second charge as close as possible to the first one after several hours have elapsed. The second shot will then explode the first. For boring the holes an ordinary 2in. auger answers the purpose well, especially if it is bull nosed ; but I hope before long to see a simple machine obtainable which will expedite the operation and materially decrease the cost.



Carting Grapes.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held at the Roseworthy Agricultural College on November 12th, 1913, there being present—Mr. G. R. Laffer (Chairman), Messrs. G. Jeffrey, C. J. Tuckwell, J. Miller, C. E. Birks, A. M. Dawkins, F. Coleman, Col. J. Rowell, C.B., Professors W. Lowrie and A. J. Perkins, and G. G. Nicholls (Secretary).

General Business.—Correspondence was dealt with in reference to dispute at Bandon Branch. The Board decided that it could not recommend the establishment of an experimental farm between Lucindale and Keith, and that the matter of compulsory registration of stallions, which had been fully dealt with by the Bureau, could not at this juncture be re-opened.

Branches.—The Branch at Bowmans was closed owing to lack of interest, and a new Branch at Beaufort was approved, with the following gentlemen as members :—Messrs. W. W. Mugford, H. C. Underwood, A. E. Sampson, C. Wilson, T. Warner, W. B. Sampson, W. C. G. Underwood, H. B. Warner, W. C. Veitch, J. Dohse, A. Tard, J. Sampson, P. H. H. Underwood.

New Members.—The following gentlemen were approved as members of existing Branches :—Yadnarie—E. Stubing ; Uraidla and Summertown—S. E. Fleming ; Belalie North—C. Trimlett, C. M. Coleman ; Coorabie—A. Oats, J. Hanson ; Naracoorte—W. Staude ; Carrieton—J. Read, S. Manning ; Parilla Well—A. Inkster ; Clare—R. H. Atkinson, F. Schultz ; Salisbury—R. G. Robertson, R. W. Cilento, J. J. Bonnar ; Maitland—W. Maloney ; Leighton—T. Bailey, R. Earle, S. Williams ; Mallala—R. H. Oliver, J. A. Arnold ; Friedrichswalde—H. Klante, R. Zerna, F. E. Pfitzner, A. Luhrmann, E. O. Pfitzner, W. Beisel ; Butler—L. G. Parkes, P. R. Parkes ; Yallunda—H. Hissey, M. Hissey ; Strathalbyn—J. A. Pyne, R. H. Haines, E. S. Walsh ; Arthurton—H. J. Coote ; Mitchell—A. Baker ; Port Broughton—R. H. Evans, G. Tothill, A. Campbell ; Monarto South—V. Braendler ; Kybybolite—S. Shepherd, E. Leishman ; Elbow Hill—T. B. E. Wake, G. Brooks ; Bandon—H. P. Beckmann, T. Copp ; Mount Gambier—H. MacCormack ; Watervale—S. Haines ; Wirrabara—J. Bowmar, D. Stuckey, J. Jericho, D. Anderson ; Moonta—O. P. L. Payne, V. G. Critchett, E. H. Martin, J. W. Ortloff, A. H. Waters ; Stockport—A. Bald, G. Cant, A. Bott, T. Fidock, J. Howard, G. Howard, F. Koch, W. G. Wait, J. Rohde, W. H. Stevens, R. Whitelaw, W. Williams, R. Williams, W. B. Woodhead ; Renmark—T. C. Angove ; Mount Remarkable—R. H. Botten ; Keith—M. Crooks, W. Till ; Coonalpyn—T. Cratty, M. Cratty ; Hartley—G. Camac ; Hookina—A. Huddlestone, B. Kelly ; North Bundaleer—F. G. Sanders, P. R. Niell, A. Coon ; Clare—H. Mayor, P. A. Cichon ; Blackwood—J. L. Light, P. W. Light, C. D. Goutch, F. Chapman ; Morphett

Vale—H. Gum; Beetaloo Valley—G. Carter, C. Bond, H. Fradd; Crystal Brook—V. H. Johns, N. E. Heaslip, V. Tyler, F. E. Burgess; Maitland—E. Moloney; Wirrega—C. Meier, F. Meier, E. Meier.

Inspection of the Farm.—Members made a thorough inspection of the College Farm, and were very much impressed with the state of the crops despite the unfavorable season, which, up to a few weeks before, had threatened to bring about a complete failure. Items of special interest were the luxuriant crops of Egyptian clover (berseem), without which, Professor Perkins said, it would have been impossible to maintain the dairy herd; also a College bred wheat (Queen Fan), which was quite free from rust, while many other well-known varieties were badly affected by the disease; and 70 acres of sorghum, which it was anticipated would yield about 1,000 tons of greenstuff during the summer months. Other details of the tour of inspection have been fully published in the daily press, and are, therefore, not repeated here. Before leaving the College the party was entertained by Professor and Mrs. Perkins at afternoon tea, and the Principal and staff were heartily congratulated upon the excellent work being carried on, the value of which to the State it would be impossible to estimate.

ADULTERATION OF SEEDS.

JOINT ACTION ADVOCATED.

Probably there are few things of more importance to agriculturists generally than that they should be able to purchase seeds true to name and free from adulteration. In the old world this question is receiving increasing attention, and the following letter from the International Agricultural Institute, Rome, which has been forwarded by the Prime Minister to the State Government, should prove interesting. Although very little of the seeds referred to are purchased by South Australian farmers, the letter shows the necessity for exercising care in procuring seeds and also, incidentally, to some degree the extent of adulteration practised. Bearing on this matter, it would be well for any person having a knowledge where fraudulent practices in regard to seed adulteration have locally been carried out or attempted to communicate with the Department of Agriculture.

" International Agricultural Institute,
" Rome, September 6th, 1913.

" The Honorable the Minister.

" We have the honor to inform you that since the Fourth General Assembly, M. de Jaczewski has presented, in the name of M. Isatchwiko, Director of the Experimental Station at the 'Jardin Imperial' of St. Petersburg, a report on the question of the adulteration of seeds.

" The activity of the stations for seed experimenting in the different countries is hampered by the absence of cohesion in their efforts and to their not being immediately cognisant of each fresh case of adulteration of seeds or blending of harmful products, to such an extent that the stations are unable to take the necessary measures for the defence of agricultural interests. This results from the fact that the reports of experimental stations are generally somewhat belated, are not widely circulated, and even in certain instances appear annually only.

" Take, for example, the Russian clover, especially the Perm variety, which enjoys, as is known, an excellent reputation as seed material. As a consequence of the demands from abroad for this clover, caused in part by the poor harvest of 1912, seed merchants on the western frontier of Russia bought up wastes of Perm clover, mixed them with varieties of Southern Europe and America, and passed them off as Russian clover. Similarly on the Russo-German frontier, some years ago, large quantities of *Silene dichotoma* (which comes from waste Russian clover) were bought, mixed with the seed of the clover of different species, and were sold under the fictitious name of Russian clover. Instances of this kind are known in the experience of almost all experimental stations.

" To counteract as much as possible practices so inimical to agriculture, M. Isatchwiko, Director of the Experimental Station at the 'Jardin Imperial' of St. Petersburg, proposes that experimental stations, upon discovering cases of falsification or mixing of harmful products in seeds, should immediately advise their central station, upon whom it would devolve to immediately publish the facts in a special bulletin. It would be equally incumbent upon that station to immediately inform the International Institute of Agriculture, at Rome, who, on their part, would, in the interests of agriculture, give it publicity in their monthly bulletin."

THE WHEAT CROP.

Official Forecast: Probable Average, 9·39 Bushels.

Under direction of the Government Statist (Mr. L. H. Sholl, C.M.G.) the work of compiling the official estimate of the wheat and hay harvest was completed by the Chief Clerk (Mr. W. L. Johnston) and other officials of the department on November 30th. The actual figures for the past season and the estimated ones for the present are given in detail in the following pages. In the table below the official totals for the State are shown, together with the estimates of *The Advertiser* and *The Register*.

1913–14.	Government Statist, Dec. 1st, 1913.	*The Advertiser*, Nov. 13th, 1913.	*The Register*, Nov. 15th, 1913.
	Acres.	Acres.	Acres.
Area under crop	2,529,022	2,575,017	2,566,000
Area to be reaped for wheat	2,076,064	2,090,017	2,131,622
Area to be cut for hay	452,958	485,000	433,818
	Bushels.	Bushels.	Bushels.
Aggregate wheat yield	19,491,585	17,268,730	18,992,742
Average per acre	9·39	8·25	8·91
	Tons.	Tons.	Tons.
Aggregate hay yield	515,331	—	405,619
Average per acre	1 ton 14cwts.	—	18·7cwts.

The report shows that the total acreage under crop is 43,591 acres less than in the preceding season, and that the estimated production of grain is less by 2,004,631 bushels, and of hay by 41,113 tons. The only division of the State in which an increase on last season's wheat yield is shown is the South-Eastern, where it is anticipated 112,596 bushels more will be reaped. "In the Far Northern and Far Western Divisions," states the report, "dry conditions prevailed throughout the season, and the crops in those areas are either absolute failures or else yielding but a bushel or two per acre." At one period of the season the outlook could hardly have been more unpromising, but the favorable weather conditions experienced in most of the agricultural areas in the two critical months, October and November, saved the situation. That with the season experienced so favorable a general result can be indicated is testimony alike to the recuperative power of the soil, the cultural methods of most of our farmers and the vitality of the wheat plant.

The following shows the estimated averages per acre for each division in comparison with the actual for the previous season :—

Division.	Average per Acre.	
	Grain. Bushels.	Hay. Tons
Central	10·41 (10·97)	1·26 (1·24)
Lower North	13·14 (13·99)	1·16 (1·20)
Upper North	3·92 (8·42)	0·67 (0·91)
South-Eastern	9·39 (9·51)	0·94 (0·83)
Western	6·02 (6·46)	0·78 (0·68)
The State	9·39 (10·34)	1·14 (1·13)

ESTIMATE OF THE WHEAT HARVEST, 1913-14.

Estimate of the Area under Wheat, and the Probable Yield of Grain and Hay for the Season 1913-14, *in comparison with the Actual Area and Yield for the Season* 1912-13.

Counties.	Area Under Wheat.						Yield.				Average Grain per Acre	
	Actual Area, 1912-13.			Estimated Area, 1913-14.			Actual, 1912-13.		Estimated, 1913-14.		Actual, 1912-13.	Estimated 1913-14.
	Total.	Grain.	Hay.	Total.	Grain.	Hay.	Grain.	Hay.	Grain.	Hay.		
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Bushels.	Tons.	Bushels.	Tons.	Bushels.	Bushels.
I. Central—												
Adelaide	51,631	7,597	44,034	50,510	7,310	43,200	117,526	73,714	100,720	66,685	15·47	13·78
Albert	86,351	73,702	12,649	88,950	76,900	12,050	496,805	8,425	505.000	9,320	6·74	6·57
Alfred	76,163	63,563	12,600	76,150	62,950	13,200	525,043	8,575	569,150	12,370	8·26	9·04
Carnarvon	891	704	187	850	710	140	5,561	197	5,610	150	7·90	7·90
Eyre	70,575	55,559	15,016	62,400	46,350	16,050	445,052	13,139	346,250	14,215	8·01	7·47
Fergusson	137,659	122,193	15.466	137,460	123,400	14,060	1,692,177	17,393	1,546,650	15,425	13·85	12·53
Gawler	146,259	90,250	56,009	141,500	89,000	52,500	1,020,678	68,122	884,600	62,210	11·31	9·94
Hindmarsh	17,917	10,522	7,395	17,770	9,820	7,950	113,201	8,999	92,770	9,105	10 76	9·45
Light	138,214	84,317	53,897	139,260	87,800	51,460	1,298,924	78,215	1,291,000	80,500	15·41	14·70
Sturt	70,060	53,287	16,773	65,140	49,700	15,440	446,063	13,962	423,900	14,380	8·37	8·53
Total	795,720	561,694	234,026	779,990	553,940	226,050	6,161,030	290,741	5,765,650	284,360	10·97	10·41
Increase + or Decrease −	—	—	—	−15,730	−7,754	−7,976	—	—	−395,380	−6,381	—	−0·56
II. Lower North—												
Burra	31,802	25,050	6,752	31,950	24,800	7,150	401,493	7,244	412,450	6,510	16·03	16·63
Daly	237,509	204,155	33,354	242,495	212,020	30,475	2,721,343	36,535	2,645,650	32,840	13·33	12·48
Hamley	1,087	200	887	1,050	200	850	700	611	1,200	630	3·50	6·00
Kimberley	17,885	15,352	2,533	17,400	14,700	2,700	131,308	1,752	55,400	1,250	8·55	3·77
Stanley	227,297	183,477	43,820	230,800	186,200	44,600	2,565,653	53,566	2,543,750	57,140	13·98	13·66
Victoria	179,273	125,670	53,603	174,180	124,900	49,280	1,980,212	69,797	1,798,500	59,030	15·76	14·40
Young	7,096	6,382	714	7,550	6,800	750	35,298	719	27,500	410	5·53	4·04
Total	701,949	560,286	141,663	705,425	569,620	135,805	7,836,007	170,224	7,484,450	157,810	13·99	13·14
Increase + or Decrease −	—	—	—	+3,476	+9,334	−5.858	—	—	−351,557	−12,414	—	−0·85

ESTIMATE OF THE WHEAT HARVEST, 1913-14—*continued.*

Estimate of the Area under Wheat, and the Probable Yield of Grain and Hay for the Season 1913-14, *in comparison with the Actual Area and Yield for Season* 1912-13—continued.

Counties.	Area under Wheat.						Yield.				Average Grain per Acre.	
	Actual Area, 1912-13.			Estimated Area, 1913-14.			Actual, 1912-13.		Estimated, 1913-14.			
	Total.	Grain.	Hay.	Total.	Grain.	Hay.	Grain.	Hay.	Grain.	Hay.	Actual, 1912-13.	Estimated 1913-14.
	Acres	Acres.	Acres.	Acres.	Acres.	Acres.	Bushels.	Tons.	Bushels.	Tons.	Bushels.	Bushels.
III. Upper North—												
Blackford	7,924	7,244	680	5,970	5,670	300	19,670	285	2,792	41	2·72	0·49
Dalhousie	91,478	72,927	18,551	76,700	70,300	6,400	800,137	19,683	364,500	5,200	10·97	5·18
Derby	—	—	—	—	—	—	—	—	—	—	—	—
Frome	123,783	100,360	23,423	111,530	97,380	14,150	940,420	19,416	449,850	10,175	9·37	4·62
Granville	11,376	11,025	351	8,150	7,900	250	29,137	189	4,000	—	2·64	0·51
Hanson	21,338	20,892	446	19,310	18,900	410	37,931	158	10,000	62	1·82	0·53
Herbert	9,893	8,902	991	8,330	7,400	930	93,798	965	10,400	47	10·54	1·41
Lytton	—	—	—	—	—	—	—	—	—	—	—	—
Newcastle	23,489	20,413	3,076	17,150	15,700	1,450	114,031	2,473	34,100	430	5·59	2·17
Taunton	15	15	—	—	—	—	—	—	—	—	—	—
Total	289,296	241,778	47,518	247,140	223,250	23,890	2,035,124	43,169	875,642	15,955	8·42	3·92
Increase + or Decrease –	—	—	—	–42,156	–18,528	–23,628	—	—	–1,159,482	–27,214	—	–4·50
IV. South-Eastern—												
Buccleuch........	60,810	55,755	5,055	67,691	61,830	5,861	365,780	3,194	424,050	3,800	6·56	6·86
Buckingham	34,806	31,824	2,982	38,030	34,940	3,090	407,235	2,487	424,480	3,600	12·80	12·15
Cardwell	5,852	5,166	686	6,300	5,400	900	34,727	363	40,640	590	6·72	7·53
Chandos	158,991	142,456	16,535	159,800	145,600	14,200	1,429,684	14,070	1,411,550	12,970	10·04	9·69
Grey	3,533	2,056	1,477	4,005	2,439	1,566	32,315	2,692	48,738	3,485	15·72	19·98
MacDonnell	5,666	5,118	548	7,074	5,790	1,284	75,660	610	98,560	1,754	14·78	17·02
Robe	6,039	5,462	577	6,415	5,830	585	80,907	668	76,520	960	14·81	13·13
Russell	31,386	27,506	3,880	32,410	29,100	3,310	191,984	2,309	206,350	1,750	6·98	7·09
Total	307,083	275,343	31,740	321,725	290,929	30,796	2,618,292	26,393	2,730,888	28,909	9·51	9·39
Increase + or Decrease –	—	—	—	+14,642	+15,586	–944	—	—	+112,596	+2,516	—	–0·12

V. Western—												
Buxton	662	110	552	1,500	1,000	500	1,002	359	10,000	500	9·11	10·00
Dufferin	12,837	11,724	1,113	12,410	11,500	910	69,276	716	86,250	1,010	5·91	7·50
Flinders	69,443	63,405	6,038	68,020	62,675	5,345	517,327	5,234	571,425	5,826	8·16	9·12
Hopetoun	16,003	14,644	1,359	16,790	16,100	690	101,562	710	51,500	175	6·93	3·20
Jervois	146,511	135,039	11,472	150,590	137,350	13,240	782,139	8,309	967,550	12,295	5·79	7·04
Kintore	28,895	27,743	1,152	29,000	28,000	1,000	128 755	594	70,000	250	4·64	2·50
Le Hunte	720	520	200	950	800	150	4,780	85	1,600	—	9·19	2 00
Manchester	419	360	59	300	300	—	960	28	—	—	2·67	—
Musgrave	29,562	25,442	4,120	30,882	26,850	4,032	214,913	3,115	150,400	2,101	8·45	5·60
Robinson	71,092	64,861	6,231	67,930	62,230	5,700	491,752	4,152	407,750	4,020	7·58	6 55
Way	100,601	94,944	5,657	95,000	90,200	4,800	524.926	2,507	315,600	2,120	5·53	3·50
York	850	840	10	720	720	—	3,871	15	2,850	—	4·60	4·00
Total	477,595	439,632	37,963	474,092	437,725	36,367	2,841,263	25,824	2,634,955	28,297	6·46	6·02
Increase + or Decrease −	—	—	—	−3,503	−1,907	−1,596	—	—	−206,308	+2,473	—	−0·44
SUMMARY.												
I. Central	795,720	561,694	234,026	779,990	553,940	226,050	6,161,030	290,741	5,765,650	284,360	10·97	10·41
II. Lower North	701,949	560,286	141,663	705,425	569,620	135,805	7,836,007	170,224	7,484,450	157,810	13·99	13·14
III. Upper North	289,296	241,778	47,518	247,140	223,250	23.890	2,035,124	43,169	875,642	15,955	8·42	3·92
IV. South-Eastern ..	307,083	275,343	31,740	321,725	290.929	30,796	2,618,292	26,393	2,730,888	28,909	9·51	9·39
V. Western	477,595	439,632	37,963	474,092	437,725	36,367	2,841,263	25,824	2,634,955	28,297	6·46	6·02
Outside of counties	970	900	70	650	600	50	4,500	93	—	—	5·00	—
Grand Total ..	2,572,613	2,079,633	492.980	2,529,022	2,076,064	452,958	21,496,216	556,444	19,491,585	515,331	10·34	9 39
Decrease	—	—	—	43,591	3,569	40.022	—	—	2,004,631	41,113	—	0·95

Statistical Department, Adelaide, November 29th, 1913.

L. H. Sholl, Government Statist.

POULTRY NOTES.

By D. F. Laurie, Government Poultry Expert and Lecturer.

During the ensuing months the weather in most parts of the State will be warm. In many country localities the farms, and as a rule the poultry runs, are much exposed. On many of the older farms there are thatched barns and sheds wherein the poultry congregate on hot days and find moderately cool quarters. Unfortunately, in a number of cases these old barns swarm with vermin (ticks and red mites). In many suburban and town yards there is very little provision of shelter. Many people must be either callous or foolish. It is most cruel to expose fowls unduly to the hot sun. Those who think it natural for bird or beast to exist in the hot glare should be taught better. I am glad to notice that the Society for the Prevention of Cruelty to Animals is championing the cause of ill-used poultry. I trust that the Society will also initiate a crusade against those who do not provide proper accommodation for their birds. Many people constantly prate about the value of tree shelters. These are not always available, nor are most trees suitable for poultry runs. The best and most enduring shades are made of galvanized iron, which is quite cool if two coats of King's compo. are applied. The iron should rest on a frame, and should be close to the ground at the back (north) and about 18in. to 24in. high in front (south). A good shelter can be made of sacking or hess an-stretched on a similar frame and covered with two coats of King's compo. These will last two or three years and are cool. All iron poultry houses should have the roof and other parts exposed to the sun painted with two coats of King's compo. This is what is always used at the Poultry Station.

Vermin.

Last summer hundreds of cases of sickness were investigated, and in nearly every case the trouble was due either to poultry ticks or to round worms. In many cases owners protested that there were no signs of poultry ticks; but in every case where the symptoms pointed to the effects of ticks these parasites were discovered. In many cases there were only a few adult specimens met with; there were always to be found numerous larvæ (the six-legged young ones). These almost invisible greyish young ticks are quite as deadly as the large ones—they all carry and distribute the spirochaete which causes tick fever. I often notice ignorant remarks on this subject, but the fact remains—the ticks cause the trouble, and must be eradicated. Makeshifts, such as patent and swinging perches, are of no permanent value—the pest must be eradicated in all cases. Those in doubt can obtain, gratis, a bulletin on this subject on application to the Poultry Expert, Adelaide.

All mites and lice must also be destroyed. Kerosene will kill all ticks, mites, and lice.

Worms are generally to be found at about this time of the year, and later on many of the most promising pullets die. It is a very simple matter to diagnose a case of worms. The young stock frequently appear to have roup; there is a nasal discharge and a rattling in the throat. The birds have an abnormal appetite and soon get thin—diarrhœa, generally greenish and offensive, sets in, and then death. If the bowels be slit longitudinally and the contents examined, the thread-like round worm will be found. In some cases they obstruct the passage; but even two or three will cause death. There are several sorts of worms—*heterakis*. A small one is *papillosa* and the larger ones, up to 3in. long, *inflexa*; some are less than a third of an inch. long. The best cure is 1 part santonine and 7 parts ground areca nut. Dose for a single bird, 7 grains; for the flock, one heaped teasponful to each 20 adults. The birds should be fasted for at least 12 hours, and the powder should be mixed thoroughly in dry bran and pollard, which is afterwards moistened. If these matters are attended to less will be heard of sickness and losses.

CANNIBALISM.

Several complaints have reached me of cases of cannibalism. Hens when laying occasionally experience trouble—very often they are over fat. In straining to pass the egg they stand up and expose the protruding parts. Other hens will, as is well known, attack any hen which is bleeding, and, although there is perhaps no bleeding, the hens think so, and will attack and fatally injure the laying hen, which is, as a rule, helpless.. The best safeguard is to have secluded and darkened nests, so that when a hen goes in to lay she will not be molested. The Chapman patent trap nest is a good preventive of this trouble, as only one hen at a time can enter to lay. An iron carbide drum placed with the opening against the side of the house makes a good nesting-place. The trouble is generally confined to Leghorns.

YOUNG STOCK.

Separate the sexes and cull out all poor specimens; market them as soon as you can get them fit. You will then have more room for the selected stock, and can give them more attention. Do not unduly force the young stock. Keep the young pullets from laying too soon. Let them grow a good frame—have them big and strong. Frequently change them from yard to yard; give them good oats and plenty of succulent green food. Precocious cockerels, which look developed when the size of pigeons, can be transferred to the "pot" yard; such birds are generally weeds and not worth rearing. Look after some that are less precocious and growing; these generally make up into far better birds. You can always find plenty of culls. Keep the best only; the others are not worth while.

Ducklings should be well sheltered from the sun. They must have plenty of clean fresh water day and night; the containing vessel should be deep enough to enable the ducklings to totally immerse their heads. Give them as much cut green food as they can eat. Provide grit and charcoal. Ducklings for market should be pushed along and fattened for sale at about eight or nine weeks—the earlier the better.

TABLE POULTRY.

There 's room for much activity in breeding table poultry. Nearly everyone I speak to on the subject—more often they come to see me—complains of the difficulty in obtaining supplies, and they also complain of the wretched fleshless birds in the markets and at the poulterers. There is plenty of money in table poultry breeding. If the wholesale buyers will not pay, then advertise your birds and sell privately. There are hundreds of buyers who will gladly pay a fair price for a good table chicken or duckling.

THE LAYING COMPETITIONS.

Intending competitors are informed that regulations and entry forms are obtainable at my office. Early application is necessary, as there are only a limited number of pens available this year. Entries are coming in freely, and those breeders who enter will be allotted the pens: there will be no ballot.

Shipping Wheat.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, to terminate March 31st, 1914.]

Competitor.	Eggs Laid for Month ended Nov. 30th.	Total Eggs Laid from April 1st, 1913, to November 30th, 1913.
SECTION I.—LIGHT BREEDS.		
WHITE LEGHORNS.		
Hurford, E. W., Grangeville	118	869
Hammill, H., Kogarah, New South Wales	132	906
Carter, A. A., Keswick	95	667
Robins, G. W., Hawthorn, Victoria	106	899
Dunn, L. F., Keswick	130	862
McKenzie, H., Northcote, Victoria	120	942
Cowan Bros., Burwood, New South Wales	125	848
Robbins, G. W., Hawthorn, Victoria	96	772
Pettigrove, T. A., Northcote, Victoria	108	855
Eckermann, W. P., Eudunda	116	705
Robertson, F., New Hindmarsh	133	719
Pettigrove, T. A., Northcote, Victoria	51	813
Cant, E. V., Medindie	95	751
Schäfer, N. H., Strathalbyn	93	856
Redfern Poultry Farm, Caulfield, Victoria	113	821
Chapman, G. H., Port Pirie	80	562
Lewis, F. M., Caulfield, Victoria	141	787
Redfern Poultry Farm, Caulfield, Victoria	126	919
Hagel, W. C., Mallala	130	826
Hocking, E. D., Kadina	116	686
Sargenfri Poultry Yards, East Payneham	95	780
Joass, W. A., Rothbury, New South Wales	140	857
Bennett & Furze, Wright Street, Adelaide	111	799
Jury, W. H., Torrensville	127	834
Olive Poultry Farm, Freeling	131	836
Kelly, Mrs. W. J. L., Quorn	80	489
Indra Poultry Farm, Freeling	129	1,017
Electricum Poultry Yards, Glenelg	102	771
Sargenfri Poultry Yards, East Payneham	135	922
Moritz Bros., Kalangadoo	125	922
Brown, S., Gembrook South, Victoria	68	828
Matthews, H. G., Fullerton	112	873
Harris, J. G., Black Forest	131	902
Tockington Park Poultry Farm, Grange	103	847
Bradley, J. E., Newport, Victoria	119	955
Miller, B., Parkside	116	708
McKenzie, E., Northcote, Victoria	141	1,034
Tockington Park Poultry Farm, Grange	131	915
Provis, W., & Son, Tumby Bay	126	881
Hillcrest Poultry Farm, Brighton, Victoria	124	876

EGG-LAYING COMPETITION—*Continued.*

SECTION I.—LIGHT BREEDS—*Continued.*

WHITE LEGHORNS—*Continued.*

Competitor.	Eggs Laid for Month ended Nov. 30th.	Total Eggs Laid from April 1st, 1913, to November 30th, 1913.
Beadnall Bros., Gawler	117	715
Morgan & Watson, Frankston, Victoria	125	989
Gibbs & Pine, Queenstown	104	612
Hillside Poultry Yards, Hamley Bridge	99	676
Hall, A. W., South Oakleigh, Victoria	136	830
Dreyer, G. H., Wolfram Street, Broken Hill	108	872
South Yan Yean Poultry Farm, Doreen, Victoria	139	869
Pope, R. W., Heidelberg, Victoria	137	980
Tabuteau, J. O., Black Rock, Melbourne	126	782
"Koonoowarra," Enfield	100	728
Hagger, J. C., Orroroo	140	890
Bertelsmeier, C. B., Clare	103	805
South Yan Yean Poultry Farm, Doreen, Victoria	140	864
Jelliff, Mrs. T., Beverley, Adelaide	136	901
Hughes, J. J., Elsternwick, Victoria	146	785
Stewart, J. R., Thirlmere, New South Wales	100	709
Aveling, T. B., Quorn	115	611
"Nunkerowi," Neales Flat	122	640
Prior, D., Moonta Mines	99	697
Leonard, W. J., Port Pirie	129	758
Barkla, L. W., Gawler South	120	712
Foreman, E., Hindmarsh	141	776
Broderick Bros., Gawler	111	659
Tubb, E. C., Frewville	121	675
Harfield, B. L., Pinnaroo	97	665
Foreman, E., Hindmarsh	115	732
Tomlinson, W., Westbourne Park	104	807
Woodhead, H., Torrensville	127	880
Padman, A. H., Hyde Park	110	818
Franklin, G., Norwood	83	842
Mathias & Weller, Unley	103	679
Messenger, A., Port Adelaide	136	869
Albion Poultry Farm, Magill	99	812
Dunstan, L. A., Port Pirie	115	719
Trenwith, T. H., Kadina	91	631
Purvis, W., Glanville	141	895
Rice, J. E., Cottonville	117	795
Evans, H. A., Richmond	131	732
Miels, C. & H., Littlehampton	119	824
Swift, W. G., Northcote, Victoria	130	898
Bertelsmeier, C. B., Clare	107	797
Brundrett, S., Moonee Ponds	131	749
Glenelg River Poultry Farm, Mount Gambier	106	755
Padman, A. H., Hyde Park	122	773
Purvis, Miss Gracie, Glanville	112	738
Braund, J. E. & H. J., Islington	140	773
Ontario Poultry Farm, Clarendon	91	606
Brock, A. G., Hamley Bridge	122	680
Russell, E. L., Salisbury	121	774
Schwabl, J., Elsternwick, Victoria	132	817
Moritz Bros, Kalangadoo	107	803
Craig Bros., Hackney	141	774
Codling, H., Mitcham Park	74	551

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended Nov. 30th.	Total Eggs Laid from April 1st, 1913, to November 30th, 1913.
SECTION I.—LIGHT BREEDS—*Continued.*		
WHITE LEGHORNS—*Continued.*		
Tidswell, H. J., Clarence Park	102	583
Bennett, E. V., Kalangadoo	98	749
Lillywhite, R. G., Malvern	125	705
Harris, A. W., Mallala	126	808
Hagger, W. H., Malvern	116	825
Winter, W. C., (Nalpa), Strathalbyn	67	496
Whitegate Poultry Farm, Deepdene, Victoria	117	748
BROWN LEGHORN.		
Toe, C. E., Brighton, Victoria	112	446
BLACK MINORCA.		
Whitrow, A. J., Knoxville	104	653
SECTION II.—HEAVY BREEDS.		
BLACK ORPINGTONS.		
Neville, A. B., Fullarton	98	708
Thornton, W. J., Kew, Victoria	108	696
Kenway, D., West Pennant Hills, New South Wales	119	918
Martin, B. P., Unley Park	113	787
Cowan Bros., Burwood, New South Wales	109	758
Tockington Park Poultry Farm, Grange	99	667
Pearson, W. S., Kingswood	113	663
Hall, A W , South Oakleigh, Victoria	84	641
Padman, J. E., Plympton	108	719
Greaves, W. E., Prospect	98	497
Bertelsmeier, C. B., Clare	45	387
Coto, T. W., Myrtle Bank, Victoria	117	794
Convent of the Good Shepherd, Oakleigh, Victoria	106	642
BUFF ORPINGTONS.		
Hocart, F. W., Clarence Park	92	599
SILVER WYANDOTTES.		
Dunn, L. F., Keswick	94	739
Western, F. C., Marion	114	582
Kappler Bros., Marion	72	546
WHITE WYANDOTTES.		
Bradley, J. E., Newport, Victoria	119	739
BLACK LANGSHANS.		
Stevens, E. F., Littlehampton	100	655
FAVEROLLES.		
Williams, W. H., Frewville	90	491
DORKINGS.		
Cathcart, J. F., Newburg, Scotland	93	514

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended Nov. 30th.	Total Eggs Laid from April 1st, 1913. to November 30th, 1913.
SECTION III.—PRODUCERS.		
Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.		
WHITE LEGHORNS.		
Broster, G., Mallala	72	746
Carling, R., Kangaroo Flat	125	876
Rowe, J., Long Plain	137	818
Broster, G., Mallala	104	788
Gilbert, F. W., Kangaroo Flat	102	873
Campbell J. D., Barabba	145	862
Forest Leigh Poultry Farm, Jamestown	77	649
Kerr, R., Longwood	130	836
Carling, Mrs . R., Kangaroo Flat	127	879
Rowe, J., Long Plains	126	812
Gill, R., Marrabel	90	670
Wurst, G. H., Marrabel	117	768
Sherrab, E , Long Plain	108	727
Rowe, N., Long Plain	117	803
Shepherd, R. H., Balaklava	124	758
Lacey, F. C., Kybybolite	50	725
Bertelsmeier, O. O., Booborowie	111	778
Dunn, H. J., Black Springs	103	641
Rackham, C. Naracoorte	114	875
Holmes, F. A., Naracoorte	72	630
Hutchison, W. J. S., Naracoorte	94	544
"Herdsfield," Mount Gambier	117	901
Smith, R. L., Hynam	101	620
Gill, Mrs. J., Kapunda	82	634
Sampson, C., Kooringa, Burra	153	912
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	100	506
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	97	679

D. F. LAURIE, Poultry Expert.

PARAFIELD EGG-LAYING COMPETITION.

MONTHLY REPORT.

HEALTH.

The birds are in good health. During the month there were six deaths, three from excessive heat and three from various other causes.

BROODINESS.

There were 160 cases in all, contributed by the following sections:—No. 1, 68; No. 2, 75; No. 3, 17 (including 4 Langshans and 7 Black Orpingtons). The high total of 68 in section 1, all Leghorns with the exception of one pen, shows that this serious fault has not been bred out of our Leghorns. Unless the greatest care is taken to exclude from the breeding pens all hens which have even once shown signs of broodiness, the time will come when our Leghorn flocks will be seriously deteriorated. It is a matter of breeding.

EGG PRODUCTION.

The eighth month has passed, and one may now offer a few figures comparing the result of the present test with those of former years. For the purpose the two previous tests have been included.

OPEN SECTION, NO. 1.

	Pens.	Eggs Laid.	Average per Pen.	Ten Leading Pen Averages.
1911-12	101	69,768	690·7	842·3
1912-13	83	63,183	761·2	930·8
1913-14	102	80,203	786·3	963·2

SECTION 2—HEAVY BREEDS.

	Pens.	Eggs Laid.	Average per Pen.	Ten Leading Pen Averages.
1911-12	25	15,821	632·8	720·2
1912-13	31	18,966	611·8	710·9
1913-14	21	13,799	657·0	755·0

TOP SCORES.

	Section 1.	Section 2.
1911-12	969 (Redfern)	836 (Craig)
1912-13	1,042 (Uren)	757 (Martin)
1913-14	1,039 (McKenzie)	920 (Kenway)

HIGHEST SCORES.

1911-12 .. 1 pen over 900 (White Leghorns) and 8 pens over 900 (White Leghorns)
1912-13 .. 1 " 1,000 " and 11 " 900 (White Leghorns)
1913-14 .. 2 " 1,000 " and 1 pen Black Orpingtons

The above figures may be considered satisfactory, especially in view of the fact that the "man in the street" freely prophesied that as the number of pens increased the scores would decrease. It will be noted that in the year 1911-12, when the official world's record was made (1,589), the pen which won had scored only 969, as against 1,039 for the leading pen in the present test. Then again, the good general averages show solid progress. In the record year there was but one pen over 900; this year we have 13 pens, including two over 1,000.

It must be remembered that in the history of the South Australian Laying Competitions the first good score came in the year when good housing was adopted. The superior houses at Parafield have no doubt contributed to the present state of affairs. During the next four months we may, of course, see many changes.

VISITORS.

Early in the month a large party, organised by Mr. T. H. Pitman, of *The Mail*, visited the poultry station. Other visitors attended, bringing the total up to 250. The month's total was 298, and the total to date 754. Judging by press comments and correspondence, the visitors have derived much benefit, and the station will serve as a centre of information.

WEATHER.

Temperatures generally mild, but with cold winds on several days. The total precipitation was 1·26, with some heavy showers.

D. F. LAURIE, Poultry Expert and Lecturer.

CONFERENCE OF HILLS BRANCHES.

(Continued from page 524.)

AFTERNOON SESSION.

CULTIVATION OF THE POTATO.

Messrs. Pope Bros. read a paper as follows :—" Two factors essential to successful potato culture are good cultivation and good seed. To get the best results these two must go hand-in-hand, or a good deal of the profit will be lost. The potato crop is an expensive one to plant, and if it turns out a failure a big loss is likely to be incurred ; therefore the very best results should be aimed at, and every minor detail should be looked after. We know of no crop that causes more backache and grumbling to harvest than a poor potato crop.

CULTIVATION.

" The land should be ploughed as early in the spring as possible, when the ground is in fit condition. Do not work the soil when it is too wet ; it is better to be a little late and have the soil in good order than plant early and have the ground wet, so that it runs together and bakes when the weather becomes hot, as it soon loses the moisture when in this condition. If the land is heavy, work it to a depth of 4in. or 5in. the first ploughing, and then go deeper the second time. If using farmyard manure this should be carted on before the first ploughing in order that it may be well worked into the soil. Fertilisers should be drilled in after the first ploughing some time before planting. Cultivate well after each ploughing and after each rain, as it helps to retain the moisture and the land works down much finer after being exposed to the sun when it gets a rain on it. One cannot give potato land too much cultivation at the right time. Deep ploughing is absolutely necessary, especially for summer planting. Don't be afraid of a little clay coming to the surface ; it will do no harm. It is better to bring it up and loosen the ground than leave it there and not loosen it. Plenty of cultivation before planting saves working afterwards and keeps the ground clean of weeds. In a district like this, with a heavy winter rainfall, weeds are troublesome. One of these is sorrel, and once it gets hold of the soil very little else will grow. We know of no better way of getting rid of this pest than working the land for potatoes in the summer. Cultivation for potatoes will also help to clean the land of wild oats. Thus, with potato cultivation, we are cleaning the land and enriching the soil. About two-thirds of the land in this district is suitable for this crop—the heavier soil for October-November planting and the lighter soil for December. Potatoes should not be grown on the same soil more than twice in succession ; rotation of crops is necessary.

They prefer new land to land that has been under cultivation ; but this cannot always be had, therefore we recommend a crop of peas grown directly prior to a potato crop, either ploughed in or harvested. Our experience is that a crop of peas ploughed under, with 4cwt. of super. and 2cwt. of bonedust, will almost double the crop. It is the next best thing to farmyard manure and much cheaper, and will build up the land for future crops.

The Seed.

" Large cut seed gives by far the best results, but it is much more expensive to plant than round small seed. It does not always pay to plant large seed on account of the cost of the tuber and the extra cost of cutting. We believe equally profitable results can be obtained because of the less cost from round seed, but this must be grown from large seed. There is no seed that will degenerate so quickly as the potato. For one planting a fairly large area the cost is a big item, and we recommend round seed for early planting, as it is not so likely to rot ; and also for late planting if there is a lack of moisture, for the round seed will germinate where the cut will not. Select the seed from the best plants, lay them out thinly, allowing them plenty of light. Under pine trees is the best place for them. Turn them over every two or three weeks, using a shovel. Rain does no harm. After they have become green frost will not hurt them. Do not let the hot sun shine on them, as it injures the shoots. If short of room, and there is no convenient place to store them, put them into old super. bags and let them remain anywhere in the weather through the winter so long as the wet does not lay under them. They will keep better this way than stored in a barn.

Potatoes as a Main Crop.

" If a storm damages the peas and hay there is some consolation in that it is not also spoiling the potatoes. We have never yet experienced poor crops of hay, peas, and potatoes during the same year. If one has been poor the other has been good ; hence the wisdom of including potatoes as one of the main crops. As soon as we have finished with one the other is ready, and as soon as we have sold one we can start selling the other, and there is always money coming in. We strongly advocate late planting for these reasons. If we plant early, say, at the end of August or beginning of September, we will almost be sure to encounter frost or a heavy fall of rain which will set the ground down hard, and it then quickly loses the moisture and rots the seed. Just when we want the moisture to form the tubers, hot, dry weather sets in, the ground is baked down hard, and the moisture is gone. If we try to cultivate them then the ground breaks up cloddy, and trouble is experienced with the grub. Early potatoes will not keep as well as late ones. Ir growing late crops soil of a sandy nature which can be kept worked is needed. This should conserve enough moisture to keep the crop going for eight or 10 weeks, planting from the middle of December to Christmas. To do this a late variety is needed. By the time the tubers begin to form in March, or early in April, the days are getting shorter, and nights dewy, and rain is more likely to fall when the potatoes need it. They will keep better, be freer from worms, and be of a better quality. Some growers are not successful because they do not plant the right variety at the right time. It is a bad policy to plant a late variety early; they will very seldom do any good. There are some varieties that do well early and late, such as Carmen No. 1 and Pinkeye; but it is absolutely no use planting Snowflakes early. Plenty of tops will be secured, but no tubers. It always pays to get a change of seed every two or three years, as the following experience will show:—From old seed grown in the same class of soil for some years from 11 rows we dug 15cwts., and from five and a half rows of imported seed grown alongside we dug 30cwts., the old seed going about 2 tons and the imported seed about 8 tons per acre. This soil was well cultivated, but the difference of the results clearly shows that it does not pay to cultivate well and have run-out seed. It is usually the custom to sell all the best and plant the worst of the tubers and leave none for the pigs.

WHEN AND WHERE TO PLANT.

This is a wide subject, and all depends on the locality, the kind of seed planted, and the nature of the soil. In what some call good potato land, *i.e.*, black flats, they should be planted about October and November with Carmen No. 1, Brownhill Beauty, Pinkeye, or Excelsior, or varieties of that kind. For late planting there is no variety to beat the Snowflake. This does better in sandy loam, and should be planted about Christmas time. We have never had a failure yet with this variety, planted at the time recommended on well-worked sandy soil. Many growers make a mistake in planting the wrong variety at the wrong time. One thing is to grow a good crop and another is to find a good market. The farmer is often to blame in the way he markets his produce. With some people anything will do, and they send a bad lot to market, and this often results in a bad name for the whole district: the guiltless have to suffer with the guilty. Inspectors should have more power to reject the inferior article and make room for the good."

Mr. C. Ricks congratulated the writers of the paper. He was not quite clear whether the crops referred to had been irrigated.

Mr. Pope said they had found that cultivation to conserve moisture in the soil was better than irrigation.

Mr. T. Jacobs said the advisability of planting potatoes on the same land twice in succession depended on the nature of the soil. He had a piece of ground on which 73 successive crops of tubers had been grown, and the present crop was looking well. He usually secured from 4 tons to 12 tons per acre from the land.

Mr. Pope thought the yield would be nearer 20 tons if other crops were put in occasionally.

Mr. Pearson (Meadows) said irrigation was advisable under certain conditions. It did not matter how often the ground was cultivated, they could not grow crops without irrigation in his locality. The water was put on by gravitation. He agreed with Messrs. Pope as to the varieties they were growing. Snowflakes did well at Meadows; White Elephants were of little use. Potatoes should be worth £2 per ton on the farm for feeding to stock.

Mr. A. Beviss (Strathalbyn) asked whether it was detrimental to put the manure direct on to the potatoes.

Mr. Pope advised working the manure well into the land as the better practice.

Mr. E. J. Oinn (Longwood) asked whether sulphate of potash or nitrate of potash had been tried on this crop.

Mr. Pope said that on new land, according to experiments, the potash had been of great benefit when used at the rate of 1cwt. per acre with super. and bonedust. Last year, whilst the tops looked better there was little difference in the returns. They had never tried cutting back the tops of the potatoes when they grew very heavy.

Mr. J. Morris (Mount Barker) had cut back part of a crop, but the portion so treated did not yield as heavily as the other.

Mr. H. Jones (Mount Barker) asked whether they had tried ploughing in white mustard as a green manure.

Mr. Pope had done so, and the crop following had been an excellent one.

Mr. W. H. Hughes (Woodside) thought the paper a very practical one. The practice he adopted was, after ploughing in peas, to put in farmyard manure when they were planting the potatoes. He was of the opinion that there was very little difference between ploughing the manure in when the potatoes were being planted or ploughing it in earlier. The broad bean was an excellent crop for ploughing in. This collected nitrogen from the air, and it did not tangle as much as the peas. Whether irrigation paid or not depended entirely on the source of the water. He was sure it was remunerative in some instances in his district, and where it was practised it would be found that there were very few small tubers in the crop. The Snowflake was a very heavy cropper, but it sold at low prices. It was a question whether it paid to grow this variety—securing a large crop, but at the same time getting lower prices for it. When there was a glut of potatoes, he thought it did not pay to grow Snowflakes. Not many years ago these were quite unsaleable, and if there had been a good crop this year conditions would have been similar. It was necessary to find a market before they went in for growing potatoes extensively.

Mr. Pope agreed that irrigation paid in some cases, but if the crop were watered and a heavy rain fell immediately afterwards there was a danger of the tubers rotting. Snowflakes grew well in sandy soil. Growers in the hills were nearly £1 per ton nearer the market than those at Mount Gambier. He planted the tubers at a depth of about 4in. to 5in. The crop was worked very little in the summer; perhaps he went over it with the cultivator once or twice. He had never tried adding salt to the land to be planted with this crop, but he had ploughed in ½ ton to 1 ton to the acre for mangolds. He strongly recommended harrowing after the plants started growing.

Mr. Stephenson (Mount Barker) asked which was the more likely to suffer from frosts—a crop that was irrigated or one that had not been so treated.

Mr. Pope said the irrigated crop was less liable to damage.

Mr. Giles (Mount Pleasant) asked whether Mr. Pope had tried any frost-proof potatoes.

Mr. Pope had tried reputed frost-proof varieties, but they had not successfully resisted the frosts.

Mr. Pearson mentioned a potato grown in New Zealand which was apparently immune to frosts.

Mr. A. F. Furniss (Woodside) asked whether Mr Pope pickled the seed before planting

Mr. Pope did not do this.

Mr. Johnstone (Uraidla and Summertown) asked whether it was advisable to sow seed grown in the district; also whether the writers of the paper had experienced any trouble with Irish blight. At Uraidla they always made a practice of irrigating. The Snowflakes generally did not grow until there was a fall of rain, with the result that there was usually trouble with Irish blight or rotting. There was less trouble with Carmens and Prolifics in this way.

Mr. Pope said best results would be secured from imported seed, but the "come up" was not so good. They had not been troubled with Irish blight in this district. The quicker the potato grew under irrigation the better. For putting in areas of 20 acres or 30 acres, as they did, the Snowflakes could not be beaten.

A delegate had found it very profitable to irrigate. He quite agreed with the writers of the paper on the question of manuring. He drilled in the manure, working the land thoroughly and getting it as fine as possible. After planting he cross-drilled the manure and irrigated. Had Mr. Pope had any experience with scab?

Mr. Pope explained that where they put in large areas it was not possible to irrigate. They had not been troubled much with scab. Pinkeyes had been affected, but other varieties had not been.

Mr. Quinn mentioned, in connection with the question as to how long potatoes might be grown on the same land without a change of seed, that he had been recently looking through the latest journals of the Horticultural Societies of England, and at Wisley they had a station where they tested matters of this nature. One man had grown his own seed of Ash Leaf kidney for over 50 years on the same land, and the yields were quite equal to the very best of 160 varieties grown from changed seed.

Mr. Ellis asked whether the writers of the paper had met with success in the use of the potato planter and potato digger.

Mr. Pope said the former had been a great success. The digger was very useful in a light crop.

Mr. H. A. Monks (Mount Barker) asked whether Messrs. Pope had had any experience as to the profitableness of feeding pigs on potatoes.

Mr. Pope did not think it would pay to feed these on potatoes at £2 per ton.

Mr. Pearson had fed a pig on potatoes and it did remarkably well; it was purchased for 10s. and six months later sold for £3.

Mr. Monks mentioned that the price of pigs at present was very high, and it had occurred to him that it would pay them to grow potatoes for feeding to these animals as well as to cows.

A delegate had been feeding pigs on boiled potatoes and pollard, and this certainly paid him.

Professor Lowrie said if it would pay to feed pigs selling at 5d. per pound on potatoes at £2 per ton, there were many crops that would give more profitable feed. If the growers at Mount Gambier could always secure £2 per ton on trucks Mount Gambier they would do very well. He could not contemplate feeding potatoes at that price.

Mr. C. Ricks made a practice of feeding small potatoes to cows. He threw them into the paddock and the animals ate them uncooked.

FALLOW OR ROTATION.

Professor Lowrie said that in the Hills districts farming was a very different proposition to what it was in the wheat-growing areas of the North. The best of the wheat country enjoyed an average annual rainfall of from 15in. to 20in., but the precipitation in the southern hills was usually far in excess of that. Yet there was a hankering on the part of some farmers to imitate the methods that were so successful further north. Some were keen on bare fallow—a thing that should be discounted where the rainfall was more than ample. In low rainfall areas it was justified to conserve moisture, but here the reasons for it did not operate to the same extent, although thorough bare fallowing might pay as a check on sorrel, drake, &c. If there was room anywhere for a system of rotational cropping, it was in the hills. They had a range of qualities of soil from very best down to the very worst. He was satisfied that even the poor, cold, raw soils could be made to yield profitable crops, but doubted that the inferior ironstone country could be made fertile economically. Bare fallowing was all right on land worth from £2 to £7 per acre that required the rainfall of two seasons to grow a full crop; but why in the world did they do it on well-watered lands worth £14 per acre? They had the facilities of growing a full crop without bare fallow. Three months previously, at a meeting at Mount Barker, he had urged them to use more lime. He had been under the impression that lime had not been used in the hills since the dawn of farming. He had since found that one or two old English farmers still carted out lime to the fields and harrowed it in.

LIME.

There was no element so likely to become deficient as lime. It was 60 times more liable to leach out under a heavy rainfall than potash or phosphates. The time was approaching when they would have to use it. The previous week he had secured three samples of soil from Mr. Pope, taken from what was classified as "good," "medium," and "poor" land. Analysis showed the good land contained ·65 per cent. lime; medium, ·12 per cent.; and poor, ·18 per cent. When the amount of lime was reduced to ·12 or even ·18 they might cultivate with the greatest skill, and apply other manures, but they would get more or less disappointment. It was commonly recognised that to remain productive the soil should have at least 1 per cent. lime; but when they got below that, direct application should be given. Professor Hall, one of the best authorities, put down the minimum as ·5 per cent. It was true that analysis was only an indication, but the figures should set them thinking. They could try the effect of applications of 2 tons of quicklime or 4 tons of carbonate of lime, and see how far it would go. The lime, its composition, and its influence on the soil, were described, and farmers were advised to try it on plots in their various fields before they concluded that it was not a profitable investment. The price for lime had been too dear to encourage its wholesale use; but freights had been reduced on the railways to the same level as fertilisers. They could buy 50-ton lots of seashells, containing approximately 84 per cent. carbonate of lime, at 10s. per ton, landed at Port Adelaide. A manure firm was also placing it on the market in a powdered form. If quicklime were preferred, farmers should co-operate to purchase a lime distributor. One ton to the acre was suggested as a suitable quantity, but they could put on two or three smaller lots of from 7cwts. to 9cwts. Twice as much seashells should be used as quicklime. He described the difference between the various kinds of lime.

DRAINAGE.

Drainage by means of tiles was not recommended for the farm on account of its cost; but in the orchard the method might prove economical. However, the farmer could make his land more productive by putting a single drain sometimes in such a situation as to tap the source of the water. Surface drains, as a rule, would prove equal to relieving the waterlogged condition of soil in the winter. Soil which was heavily waterlogged in winter was the first to give out for want of moisture as soon as hot weather came. By drainage they would secure aeration of the soil and encourage the roots to go downward instead of remaining near the surface to be parched with the first dry spell.

LEGUMES.

Legumes formed one of the most suitable crops in a rotation in the Mount Barker district. They were excellent for fattening stock, and in this way, as well as by nature of their nitrogen collecting from the air, they enriched the soil. He was not too keen in ploughing them under, preferring to feed them down where practicable. More use should be made of rape and mustard. The former was one of the best subsoiling plants they could use. In wet districts it was therefore of peculiar value. The presence of mustard would lessen the risk of loss of stock when feeding down. The seed could be sown after the rape had germinated if they were afraid of "seeding" up their land. Sheep did not care for mustard alone, but when put on a crop of mustard and rape they would go for the mustard first. Italian rye grass was an invaluable crop. They had to be careful, however, to make sure they were really getting what they ordered, as three-quarters of the seed on the market was not the real article.

Mr. H. B. Welch (Port Elliot) asked whether it was advisable to apply salt to the land in the Inman and Hindmarsh Valleys.

Professor Lowrie replied that while applications to the land might not be necessary it would be advisable to provide salt licks for the stock. A dressing of kainit might be applied. It was better to apply carbonate of lime than gypsum. The proportion of calcium oxide in gypsum was relatively small, only about one-third of that contained in a good sample of carbonate of lime. It did not reduce sourness; in fact, if they were continuously using it, it would encourage this condition. The gypsum might be of use in alkali country, such as was met with on the Murray. It was not necessary to apply lime to limestone land unless in exceptional cases. He would not recommend sowing lime through a drill, which was asking more than should be required of it.

Mr. Nicholls (Longwood) had for several years applied slacked lime to land in his district. He had found it altogether too costly. In connection with new land in the district it was found that bonedust acted very much more quickly than superphosphate. The conclusion he came to was that this was probably due to the fact that the land was very sour. Since lime had been used, much quicker and better results had been secured from the superphosphate.

NEXT CONFERENCE.

It was decided that the next Conference should be held at Longwood.

WEIGHTS OF SUPERPHOSPHATE.

Mr. T. B. Brooks (Clarendon) moved—"That it be made compulsory for all manufacturers of manures to stamp the weight of the contents on each bag." When they purchased manures, he said, there was a danger of their not receiving full weight. The Government Produce Department and the Abattoirs followed the practice, which it was proposed should be made compulsory. The loss to the farming community of South Australia in this connection ran into thousands of pounds yearly.

Mr. Phelps (Clarendon) seconded the motion. He thought the proposal quite a reasonable one. They had a right to see that they got what they asked and paid for. The loss occurred in connection with small lots, when 13 bags were purchased for 1 ton. If they complained to the merchants it was attributed to shrinkage or leakage. They had the quality guaranteed, and they should also have the quantity guaranteed likewise.

Mr. T. Jacobs (Cherry Gardens) failed to see that they would secure any advantage by having the weights printed on the bags. The fertiliser was bagged up when freshly made, and it gradually lightened. If he asked for a ton of manure he could demand the full ton weight, irrespective of whether the weight was branded on the bag or not.

The motion was carried unanimously.

EVENING SESSION.

SOME COMMON DISEASES OF THE PIG.

The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) delivered an address on this subject, in which he said—An old work on farriery, dating from the seventeenth century, prefaces remarks on diseases of swine with the following :—" The pig, like other animals, has many diseases ; but you may as well drench the devil as drench a pig." And after the lapse of 300 years there is still a great deal of sound common sense in the advice.

On the other hand, the pig is undoubtedly the best paying of all live stock, even if one does not go to the length of agreeing with a certain South Australian authority, who used to contend that one could get four litters a year from a sow. Still the practical certainty of two brings in a return on capital with a bountiful interest that cannot be expected of other farm animals. The economics of feeding swine show that there is a gain of 1lb. live weight for every 4½lbs. of dry feed given, as against the 1 to 10 of cattle, so that undoubtedly the pig is " the gintleman that pays the rent."

There is always a tendency in South Australia to ignore attention to the details of physiology and diseases of pigs and sheep owing to their small individual value ; but if one calculates them as intrinsic factors of a large proportion of the national wealth the importance of such knowledge must not be too lightly dismissed, especially when one considers that but a few years ago the losses from swine fever, plague, and tubercle in the United States of America amounted to £15,000,000.

Prevention is of far more importance than the treatment of disease or the wiping out of affected herds, and far cheaper, too; but the time to begin preventive treatment is six months ahead of an outbreak in the herd—in other words, attention to the physiology of the pig's digestive organs, cleanliness of its surroundings and hygiene of its body are things which no pigkeeper can ignore if he wants to make his pigs pay. Naturally one is inclined to smile at the idea of attending to such things when one thinks of the ordinary pig and the ordinary sty; but the fact remains that in its natural surroundings the pig is the cleanest of all our farm stock, and kept as we keep it it is the only one which makes its bed morning and evening, and uses as a privy the corner of its sty furthest from its resting-place. Its stomach is the most complicated of all our farm stock, and deals with a large variety of food in a most effectual way, disinfecting putrid meat or rotten fruit, to say nothing of the myriads of germs in the milk of the swill tub, in a fashion that no other animal could; and because it can do this we rather illogically conclude that it is not happy unless it is doing so, and put a tax on its digestive system that lowers its vitality and renders it liable to diseases such as swine fever, swine plague, tuberculosis, and so forth.

While pointing out these facts one does not necessarily imply that the grooming of pigs as attempted by a certain new boy at Roseworthy is desirable, or that they should shiver in a bare concrete sty because bedding might harbor a louse or two, or that they should contract rheumatism while becoming inured to a constant slushing out of their houses with the hose. But one does lay stress on the fact that breeds of strong vitality are most desirable: that feed of such character that the skin, the bowels, the kidneys are stimulated to carry out their duties regularly is what is wanted, accompanied by a certain amount of exercise: that clean houses and drinking water will do much to prevent the development of worms, lice, and other parasites which play a very important part in the spread of disease. While the excellent organisation of the Stock and Brands Department places at the disposal of the pigkeeper inspectors of experience and veterinary surgeons well versed in the diseases from which swine suffer, and as many of these are of a highly contagious nature, and as it is far easier to put out a small fire in its early stages than to attempt to smother it when it has a strong hold, it is not only the duty of a pigkeeper to report disease among his pigs to that department, but it is decidedly to his financial advantage to do so. Stock inspectors are not ogres whose one desire is a sacrifice of swine flesh. The stealthy burial of a defunct porker (*a la* Sir John Moore) at dead of night may be the natural action of a man desirous of hiding the evidence of his guilt; but to speak plainly it is a fool's proceeding, and one which will most likely only precede the loss of many more pigs, till in despair the help of the authorities will have to be called in, and naturally they will not be best pleased at finding an outbreak of disease which has been going on for weeks or months, and the measures they then have to adopt are far more drastic than they would have used earlier. As with all classes of livestock, the less medicine is resorted to with pigs the better for them and the more profitable for their owner. But one has to realise that human nature will insist on pouring medicine of some sort or other down an ailing pig. One of the most satisfactory ways of drenching a pig is to have a good strong slip over the snout and over a beam so that the pig is backed into a corner. Naturally he squeals. He cannot squeal and chew at the same time, so if an old boot with a bit cut off the toe is put into his mouth he stops squealing and chews. Then in comfortable sized mouthfuls poured down the boot he will swallow the medicine. If it is given too quickly he will choke or waste it. Small pigs can have the snout tied up and the medicine put into the corner of the lips, as with a dog; but the less they have the better.

It is a good plan to put any of the coal tar disinfectants, such as Jeye's or Pearson's fluids, in the swill, especially in hot weather, a pint or two to a barrel: this checks worms, maggots, and so forth, and helps digestion too.

There are also many simple correctives which are of great value to the pig, and can be given in the food, such as sulphur, coal, charcoal, wood ashes, Epsom and Glauber's salts, and limewater, to say nothing of patent pig powders, which usually depend for their efficiency on some of the above, combined with spices like fenugreek, aniseed, &c. Ground castor seeds are excellent medicine for a pig, from a ¼oz. to 2oz. in the feed, especially for worms, when a similar quantity of melon or pumpkin seeds help.

When dealing with disease in swine the first thing that comes into the mind is swine fever, in the same way that in the human being just now any innocent rash is suspected of being smallpox. On the other hand, swine fever is, fortunately, just about as rare as smallpox; but there is another and very similar disease, which is unfortunately more common in South Australia, called in Europe and America swine plague, but here contagious *pneumo-enteritis*.

It happens that the symptoms and general course of the two diseases have much in common, and from a farmer's point of view it will be as well to discuss them together, especially as the means to combat the two are practically the same.

In pigs the early symptoms of disease are not so marked as in other animals, and so it happens that very often the first intimation that anything is wrong is the death of a pig or two; but to the eye of the man who takes an interest in his pigs there are earlier signs, which should not be neglected. Fever, shivering, unwillingness to move, loss of appetite, with a distinct rise of temperature from the normal 103° to 106° or 107°. Have more than one thermometer, for breakage is very common in an unpractised hand. The pig is dull and stupid, hides in the bedding and is unwilling to leave it. At the outset the bowels may be normal, or even constipated, but later on an exhausting diarrhœa with a very typical smell sets in and persists. The eyes are congested and watery, and later a yellowish thick matter gums the lids together. The breathing is rapid and oppressed (in the later stages actually labored); while there is also a rather typical cough, not very frequent, but noticeable when the pigs are driven about; sometimes paroxysmal, but more commonly single, dry, and husky. The skin of the belly, inside the elbows and thighs, and behind the ears is discolored, varying from a pinky red to a dark purple, with, in the case of swine fever, a distinctive eruption which develops into crusts and scabs. Flesh is lost rapidly, the back is arched, and the pig is tucked up and weak; it totters in its walk and often loses the use of its hind legs altogether. The course of the disease varies from three days to three weeks.

In swine plague the lungs being more acutely diseased, the breath is more markedly affected, and the scabs and crusts are not so noticeable.

On opening a pig which has died of swine fever reddish spots will be noticed on the skin and surface of organs like the lungs and stomach. They are absent in swine plague, and occur because the swine fever germs have a habit of clumping together and plugging the small blood vessels, which burst, or the serum oozes through. The spleen is usually enlarged, as are the glands attached to the various organs, especially those of the caul fat (the mesenteric glands), the lining of the chest and belly (pleura and peritoneum) is inflamed and covered with red spots, as are the stomach, bowels, lungs, and kidneys, while in the stomach and bowels clotted blood is frequently found. The real test of swine fever, however, is found in ulcers which occur in the bowels where the small guts enter the large (the ileocæcal) valve. These ulcers vary in size from a pea to half-crown, and are most common in the big gut (the cæcum), that pear-shaped gut which ends in a blind point. They are more or less circular, and project from the surface of the gut with raised and rounded edges, and vary in color from yellow to black according to the time they have been in existence; in very severe cases they actually perforate the bowel, as in human typhoid.

The disease assumes two forms, the acute and chronic. In the former the ulcers are very angry and usually not large, while in the latter they are deeper, but more sluggish in character.

The *post-mortem* appearances in swine plague are distinct from those just described. The ulcers are lacking and the lungs show very characteristic changes. There is a loss of the natural pink color, and patches of them are grey, while here and there appear greyish-black spots called "necrotic areas," which break down into cheesy matter, while there are fibrous deposits on the heart bag and lining of the chest. The throat and bowels are often lined with a so-called croupous deposit, yellowish-white to grey in appearance. In plague the mischief begins in the lungs and spreads to other organs, while in swine fever it begins in the bowels and occurs secondarily in the lungs, &c.

When several pigs die, especially on neighboring farms, one or other of these diseases may be suspected to exist, and no time should be lost in informing the Stock Department, who will decide the matter, and all precautions to prevent spread of infection should be taken, remembering that the disease is spread by men, rats, mice, lice, and other agencies which are not always well under control, while feed and filth are responsible for many an outbreak.

The virulence of swine fever varies greatly from a mortality of 100 per cent. down to less than 20 per cent., and towards the end of an outbreak the majority of animals recover—if a lean stunted growth can be termed recovery—and in addition to never being profitable they may carry the germs for an indefinite time and remain a source of danger.

As the Stock Department determine the method of dealing with affected animals it is not for me to suggest treatment, but more than 20 years of stamping out in England has only resulted in a larger number of pigs being affected now than then; while in countries like Hungary and Holland the almost impossible task of stamping out has been replaced with a preventive, and to some extent curative, treatment of injecting a serum made of extract of dead germs, which greatly modifies the course of the disease and acts as a preventive to in contact pigs. The cost is small, about 6d. a head, and it is carried out by the State veterinary surgeons, and appears to be well-suited to conditions as they exist in South Australia, where herds are more or less isolated, and swine fever does not occur in its more virulent form.

The following mixture, at the rate of one tablespoonful to each 200lbs. of pig once daily, is also recommended as a preventive when the disease is about:—1lb. each of black antimony, charcoal, sulphur, and sulphate of soda; 2lbs. each of bicarbonate and hyposulphite of soda. Thorough disinfection of premises with hot lime to which a little carbolic acid has been added is most desirable, and a tub of disinfectant should be kept to dip boots, etc., in. Isolation and dry housing are also needed, while pigs kept in small lots escape infection more readily.

Burning infected carcasses is preferable to burying, and is not expensive if cross trenches, about 4ft. or 5ft. long and about 9in. deep, are cut out, the earth being thrown into the angles, and wood to get a hot fire going laid on it. The draught runs through the trenches however the wind may be, and the fat of the pig supplies the extra fuel, while wood thrown on top only damps the fire down.

TUBERCULOSIS.

Tuberculosis is the next disease to hold our attention for a few minutes. It is far more important than swine fever, though much less frequently talked or thought about. Its importance may be gauged when the value of pork destroyed on account of it in a recent year in America amounted to roundly £160,000; double that of beef in the same period. The chief danger of the disease lies in its insidious nature. It is seldom noticed during life, while every meat inspector knows how common it is in pork; and, as every pig man's endeavor is to force his pigs along, it is remarkable how, in spite of good feeding, it obtains such a hold in young pigs. These animals are doubly unfortunate, as they contract the form which affects cattle and the human kind with equal facility, forming a link whereby the cattle disease may be transmitted to man and from man to cattle.

The main symptoms are wasting, cough, enlargement of glands, especially those in the neighborhood of the throat, and diarrhœa; but the disease frequently exists to a very marked degree in various parts of the body without any external symptoms being noticed, and this renders the disease doubly dangerous, for it is highly contagious from pig to pig, even if one may dismiss the question whether it is so from pig to man. It renders at least 20 per cent. of the herd among which it makes its appearance ineffective as meat or brood sows, for a sow seldom carries her young successfully when tubercular. It forms a tax that none but a millionaire could afford to pay, and certainly he would not.

Probably the chief sources of contagion are milk and the droppings of affected cattle or pigs, while discarded food from infected human beings is no mean factor in its spread.

Post mortem, the appearances of the disease are in many ways similar to those in cattle. The chief places in the pig where it is found are the lymphatic glands—those kernels which one finds under the tongue and in the meat of the neck, as well as between the lungs above the heart and along the runners between the caul fat layers—as well as in the muscles of the ham and near the tail, those under the tongue and in the neck being the most frequently attacked, for the disease is almost invariably taken in with food, and these outposts of the sanitary corps of the body are the first to fight the enemy.

The changes which occur in the glands are first simply enlargement, then bloodstaining, then small areas of infiltration of the large white cells of the blood, whose duty is to destroy the germs, then little spots or tubercles from which the disease is named, which at first simply break down as mattery points, and later run together, forming a cheesy mass which later changes to a gritty substance, the result of Nature's walling in the enemy. In the earlier stages, as the tubercles break down, colonies of germs escape into the blood stream and attack other places such as the lungs, liver, and spleen, and so the disease becomes generalised.

The risk to men eating tubercular pork the lecturer personally holds to be a very light one; but better authorities than he hold the opposite opinion; but he is heart and soul with them in their endeavors to stamp out the disease, because he knows that profitable as the pig industry may be, it can never, in its palmiest days, stand the impost of 20-100 per cent. deterioration.

Possibly, from an experimental point of view, treatment would be successful and would certainly be interesting; but from a practical side it is out of the question, both from the side of expense as well as on account of its very doubtful success, and with efficient inspection the risk to the consumer would be small and the loss to the owner almost negligible if the carcasses were suitably dealt with as they are in the German Freibank.

ANTHRAX.

Anthrax is the next disease to claim our attention, and fortunately it is not common in South Australia; but should one find one's pigs dying one or two a day, and others seeming seedy with swollen throats, not a moment should be lost in informing the Stock Department, as the disease most commonly shows itself in this way, and frequently an outbreak occurs after the pigs have had a feed of some carcass that has died from an unknown cause. Anthrax is less virulent in the pig than in cattle or sheep, but it is equally dangerous to man if contracted from the pig. If there is the slightest suspicion of the disease, strict precautions should be taken to prevent spread, and anyone who handles pig or carcass should use strong disinfectants on the hands, washing soda being one of the most efficient.

Following these contagious diseases, the management of which is a departmental rather than private matter, we may glance for a few minutes at the various forms of worms which affect pigs, and which are a matter of serious importance, both to the pig and his owner.

WORMS.

Unfortunately, owing to the want of hygiene with which pigs are generally kept, worms are an increasing nuisance, as they are with other stock, and at the risk of being a Jeremiah, the lecturer would again insist on the acute necessity for not neglecting the proper destruction of these pests, which are carried by lice and cockroaches, rats and flies. They may so be spread indefinitely, while their enormously rapid rate of increase practically ensures their survival under conditions the most adverse, namely, cleanliness and care; while we know, only too well, that every condition of ordinary pig-keeping is most admirably adapted to favor their spread.

This is not the occasion, nor were it, would time permit to go into the detail of the life history of the various worms which inhabit the stomach and bowels of the pig; but there are the two common round worms, one like that in man (*Ascaris suis*), the other also about 6in. long (*Echinorhyncus gigas*); the threadworm in the large gut (*Trichocephalus crenatus*); the pin worm, allied somewhat to the blood worms in horses (*Oesophagostomum dentatum*), and scarcely visible to the naked eye; the tiny *Trichina spiralis*;

and a big round worm which prefers the kidney for a home (*Eustrongylus gigas*). All these are rendered less active by the coal tar extracts suggested earlier. Dosing for worms depends, of course, on the age and size of the pigs ; but the following drugs will be found among the more useful :—Castor oil, 1oz. to 4ozs. ; castor seeds, ½oz. to 2ozs. ; pumpkin and melon seeds similarly ; wormseed oil (*Cheopodium*), 5 drops to 10 drops ; chloroform, 20 drops to 60 drops. Once a day is often enough, and all of these will mix with a little milk. They should be given in the morning before the pigs have anything to eat. Turpentine, 20 drops to 30 drops ; and lysol, 20 drops to 30 drops, with a little milk, are often found good also.

Another class of internal parasites is the cystic forms of worms which develop adult forms in other animals ; for instance, hydatids, which also affect man (*Echinococcus veterinorum*), the bladders of which are frequently found in large numbers on the liver and other organs in the pig. Measles, the common name for the cysts of *Cysticercus cellulosae*, minute little sacs which affect the muscles of the tongue, heart, diaphragm, shoulders, and hams, and develop in man into the tape worm (*Taenia solium*) if insufficiently cooked pork is eaten, also affect this animal. A pig affected stands with his shoulders humped up and squeals out of nervous pain if roughly handled ; and if his tongue is looked at by putting a stick in his mouth as a gag the cysts may be seen on the sides of the tongue and cheeks.

The *Trichina spiralis* just mentioned encysts itself in the muscles of the pig, and develops in man some eight or 10 days after eating raw pork, causing extremely painful rheumatic pains in the back and limbs. The worm exists in South Australia ; but, fortunately, raw pork is practically unknown as a food for man ; yet there is a certain amount of risk, as the cysts are so small in pork as to require a microscope to find them.

Treatment of all these cystic parasites is out of the question, and it is false economy to attempt to bring carcasses so affected into use for human food. The Mosaic prohibition of the use of pork was based chiefly on these undesirable conditions.

LICE AND MANGE.

External parasites must claim our attention for a few minutes. They are mange and lice ; but the latter are so big that they are generally called ticks. The general symptoms are irritation and scurfiness in mange with the very apparent presence of the lice in the second condition. They are sometimes so numerous that they appear to be coming out of the eyes and nose. Treatment is best applied by spraying with Cooper's dip on ground that the pigs will not root after because of the poison. Lysol or other coal tar spray may be substituted ; but in either case it is well to rub the pigs over with any cheap machinery oil after drying as this chokes the parasites. A little sulphur may be used as well with advantage ; but all litter must be burnt and the houses well sprayed out with formalin or lysol, preferably hot, and at least 5 per cent. strength. They should then be limewashed with hot lime, to which 1oz. of crude carbolic to the gallon is added. Eczema is sometimes mistaken for mange, and *vice versa*, but as the treatment is the same such a mistake in diagnosis is of little practical importance.

Digestive diseases usually show in swine by diarrhœa or constipation. Either form calls for the correctives mentioned earlier; but if the diarrhœa is persistent some astringent may be required, and may be cheaply and effectively found in chalk or wattlebark, a few ounces of either being given in the feed, or a decoction of wattlebark being mixed, a pint or so, with the slop. Diarrhœa follows sudden change either of food conditions or weather, and must not be neglected in young pigs, which often benefit by a preliminary dose of castor oil. It often takes the specific form of white scour, so fatal to new litters. This is a form of swine plague, and is probably best met by small and frequent doses of lysol in milk, 10 drops to 20 drops, according to age and severity of attack. All discharges must be quickly removed and floors disinfected if one hopes to check the disease. Constipation is best met by a fruit diet (generally obtainable) or Epsom salts. If obstinate in new born pigs, a few drops of glycerine put into the vent will generally cause the bowel to work.

Canker, or sore mouth, often so troublesome in young pigs, and accompanied by blisters and scabs with swelling of the limbs at times, is cheaply and effectively dealt with by putting an ounce of Condy's crystals into a kerosine canful of warm water and dipping the pigs' heads well into it.

Black teeth, that often cause much anxiety, are only a symptom of indigestion which calls for charcoal or ashes in the food.

MUMPS.

Quinsy and throat cough arise from swollen glands in the throat, and are relieved by hot milky food and hot oil rubbed into the swelling outside with a few drops of tincture of belladonna given occasionally. Any such swelling of the throat must be looked on with suspicion, as anthrax or tuberculosis may be the cause.

Breakdown or rheumatism are two convenient terms for covering any form of illness, the diagnosis of which puzzles the owner. The general illhealth, the lameness, loss of condition, and so forth are only symptoms; but in the light of modern knowledge they are symptoms which point to worm trouble and deficiency in substances required by quickly growing animals. The latter is always the case in "thumps," that condition when the beating of the heart can be heard across the yard. The conditions usually yield to vegetable tonics such as quinine, wattlebark, and so forth, especially if a little yeast and molasses are added to the food. Dry and healthy houses are an essential part of the treatment.

Time does not permit of dealing with diseases of sows connected with their special function ; but it may be well to point out that udder ill yields readily to inunctions of warm glycerine or hot soapsuds, neither of which disgust the sucklings.

A fitting close will be a few words on sunstroke, which may be expected after leaving the salubrious air of the hills in the freshness of the morning, and, after a crowded exciting journey, to be chased around the pig yards at Dry Creek without shelter or water during the heat of the day. Treatment must be quick and energetic. Bleed by cutting off the tail, get plenty of cold water briskly on to the body from a strong hose, stimulate the breathing with snuff or powdered tobacco or ammonia in some form or other, and the pig may yet make a carcass that will set.

No attempt has been made to deal exhaustively with the diseases of swine, but the lecturer hopes that, from a farmer's point of view, he has been able to give a hint or two which may enable the owner to avoid dead pig and procure bacon instead.

At the conclusion of the address a number of questions were asked and answered by the lecturer.

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Near Bridgewater.

THE WHEAT MARKET.

Prices on the local wheat market firmed slightly during November, but not much activity was shown. As yet but little new grain has been sold, but, judging from reports received, most of that delivered to buyers' agents was of good quality and weight.

Commenting, under date London, October 31st, on the English wheat position, *Beerbohm's Evening Corn Trade List* states—" Whilst most descriptions of wheat, at the commencement of the present week, had declined about 1s. 6d. compared with two months ago, the loss on Manitobas amounted to about 3s. 6d., and the recovery of 1s. to 1s. 3d. may be described as a natural reaction, accentuated by less favorable weather reports from the Argentine and firmer American markets. This week's Argentine cables have been somewhat conflicting, but, although low temperatures have been recorded on two or three days, very little damage appears to have been done so far, and the latest cable states that the weather is warmer and favorable in most districts. The latest reports from Australia describe the crop outlook at the present time as being very promising. Good rains have fallen over practically the whole of the Commonwealth, assuring, with ordinary climatic conditions in the future, a record yield. There is no improvement in the position so far as India is concerned, and a good rainfall is still urgently wanted in many districts.

" Shipments last week were on a large scale, but promise to be appreciably smaller this week. The total exports to Europe in the first three months of the season have amounted to 19,000,000 quarters, against estimated requirements of about 16,500,000 quarters. Stocks in U.K. ports are now 2,300,000 quarters, or the same quantity as on the 1st of August, the excess in imports over requirements being entirely in Continental countries, and in all probability millers there generally hold fair stocks.

" The American markets have been distinctly firmer this week, and prices have advanced 1½c. to 1⅝c. Receipts at Western Points continue on a much smaller scale than at this time last year, and the total since the commencement of the season now shows a fair decrease compared with last year's total, but is considerably larger than in either of the two previous years. The visible supply, which began increasing on a large scale much earlier this year than last, shows a very small increase this week, against a very large increase in the corresponding week of 1912. North American mail advices continue to describe the position of wheat on the other side as more or less an international one, the general opinion being that the course of prices will be mainly governed by the movements on the European markets, which, in their turn promise, especially so far as distant shipments are concerned, to be principally influenced by the progress and results of the Argentine and Australian crops. Still later in the season the crop outlook in India will also have some effect."

Date.	LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
Nov. 6	Very dull; lower to sell	3/5 old, 3/4½ new	3/5 old, 3/4½ new	3/5 old, 3/4½ new
7	Dull and neglected	Do.	Do.	Do.
8	Steady, but quiet	Do.	Do.	Do.
10	—	3/5	3/4½	3/4½
11	Steady, but quiet	Do.	3/4½ to 3/4¾	3/4½ to 3/4¾
12	Steadier tone, not active; Australian new crop, 4/4½; Liverpool steady, but not active	Do.	Do.	Do.
13	Steady, but quiet; Liverpool easier	Do.	3/4½ to 3/5	Do.
14	Steady	Do.	Do.	Do.
15	Firm, but quiet	Do.	Do.	Do.
17	—	Do.	3/5 to 3/5¼	3/5 to 3/5¼
18	Rather dearer; Liverpool 3d. to 6d. advance; Dec.-Jan., 4/5¼; Jan.-Feb., 4/4⅞	3/5½	Do.	Do.
19	Firm; sellers asking 3d. to 6d. advance; Liverpool firm	Do.	Do.	Do.
20	Firmly held, inactive	3/5½ to 3/6	3/5 to 3/5½	3/5 to 3/5½
21	Firm, but inactive; Liverpool very firm; Jan.-Feb., 4/5¼	3/6	3/5¾	3/5¾
22	Firm, but inactive; Liverpool firm at full rates; Oct-.Nov., 4/6	Do.	Do.	Do.
24	—	Do.	Do.	Do.
25	Firm, rather dearer; Liverpool very firm	3/6 to 3/6½	3/6 to 3/6¼	3/6 to 3/6¼
26	Steady, but quiet; Liverpool firmly held, inactive	Do.	Do.	Do.
27	Firm; June-July, sailers, 4/6¾; Liverpool steadily held, not active	3/6½	3/6¼ to 3/6½	3/6¼ to 3/6½
28	Steady, but quiet; Liverpool quieter	Do.	Do.	Do.
29	—	Do.	Do.	Do.
Dec. 1	—	3/6	3/6 to 3/6¼	3/6 to 3/6¼
2	Firm, held for 6d. advance	Do.	3/6	3/6
3	Very dull and lower to sell; Liverpool quiet	Do.	3/5¾	3/5¾
4	Quiet	3/5½	3/5½ to 3/5¾	Do.

Steamer Freights.—(December 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, medium size, Dec.-Feb., 30s. per ton (9⅗d. per bushel), March, 29s. per ton (9⅕d. per bushel); to South Africa, 27s. 6d. per ton (8$\frac{9}{10}$d. per bushel), prompt or new season. Parcels, Port Adelaide to London-Liverpool, or Continent, 27s. 6d. per ton (8$\frac{9}{10}$d. per bushel); Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel); to Sydney, 10s. 6d. per ton (3¼d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 30s. per ton (9⅗d. per bushel), new crop; South Africa, 25s. to 26s. 3d. per ton (8d. to 8⅗d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

The General Manager of the Produce Department reports on December 1st—

Butter Factory.—The supply of cream received last month was larger than that received in October, was of excellent quality, and the sales were proportionately large. Prices varied very slightly during the month, rates at the end of the month being superfine, 1s. 1d.; pure creamery, 1s. There is every prospect of a slight rise shortly.

A. W. Sandford & Co., Limited, report on December 1st—

Butter.—Quantities of cream and butter further increased last month, and for top grades values maintained firm, best factory and creamery, fresh in prints, selling at 11d. to 1s. 1d. per lb. In other lines, however, prices are a little easier, separators and dairies selling at 9½d. to 10½d. per lb.; store and collectors' lines, 7¾d. to 8½d. per lb.

Eggs. Large supplies came forward, but under the influence of a steady demand, rates held with but little alteration. Quotations—Hen, 8½d. per dozen; duck, 9½d.

Cheese – The month's trade was a very heavy one indeed, record quantities arriving. Prices eased somewhat, though with inter-State markets operating, good clearances were effected. Present quotations, 5¼d. to 5¾d. for large to loaf.

Honey.—Last season's take of prime samples are practically cleared, and buyers are waiting the new season's, which may be expected shortly. Present price for prime clear extracted, 3¼d. per lb.

Almonds – Stocks are exhausted, and already quotations are being asked for the new crop. Brandis, 6¼d.; mixed soft-shells, 5¾d.; hard-shells, 3d.; kernels, 1s. 6d. per lb.

Bacon.—Values show very little alteration for the month, the scarcity of the live hog and consequent high prices somewhat affecting sales in this line. Hams are in good demand, the trade purchasing in anticipation of Christmas. Best factory-cured sides, 10d. to 11d. per lb.; hams, 1s to 1s. 2d. per lb.; well cut and cured farm middles and rolls, 8d. to 10d.; country hams, 9d. to 11d per lb.

Live Poultry. – Consignors throughout the month realised very satisfactory prices for all classes where quality was right, and good rates are likely to rule from now on, as buyers are purchasing extensively in anticipation of the Christmas wants. Good table roosters brought 3s 3d. to 3s. 9d. each; nice conditioned cockerels, 2s. to 2s. 6d.; hens and light cockerels, 1s. 9d. to 2s 3d.; ducks, 2s. 3d. to 3s. 8d.; geese, 5s. to 5s. 6d.; pigeons, 9d.; turkeys, from 9d. to 11d. per lb. live weight for fair to good table birds.

Potatoes and Onions. –The Adelaide market is now drawing practically the whole of its potato requirements from local sources. Supplies are plentiful and moderate prices seem assured. Onions—There has been a little difficulty recently in getting new onions suitably dried for long distance trading, but the warm weather now setting in will speedily correct this trouble. Local crops are good, and as reports from Victoria indicate a heavy yield, high prices appear to be out of the question. Present quotations – Potatoes, Gambiers, £5 10s. to £6 per ton on rails Mile End; 5s. per cwt. in the market. Onions—Gambiers, £8 10s. to £9 per ton on rails Mile End; 8s. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of November, 1913, also the average precipitation to the end of November, and the average annual rainfall.

Station.	For Nov., 1913.	To end Nov., 1913.	Av'ge. to end Nov.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.				
Oodnadatta	0·35	5·78	4·33	4·76
Tarcoola	1·27	8·15	7·25	7·58
Hergott	1·01	5·74	5·39	6·04
Farina	0·52	5·85	6·11	6·70
Leigh's Creek	0·39	6·37	7 83	8·66
Beltana	0·60	4·76	8·43	9·22
Blinman	0·89	6·66	12·00	12·85
Hookina	1·19	7·47	—	—
Hawker	1·15	7·72	11·36	12·22
Wilson	1·07	7·88	11·01	11·78
Gordon	0·72	6·81	9·63	10·26
Quorn	0·89	7·63	13·17	13·78
Port Augusta	0·57	5·94	8·95	9·46
Port Augusta W.	0·59	6·05	8·73	9·36
Bruce	0·75	6·84	9·57	10·01
Hammond	0·78	7·58	10·77	11·46
Wilmington	1·07	11·77	17·42	18·26
Willowie	0·50	6·56	11·30	11·90
Melrose	1·00	14·13	22·14	23·04
Booleroo Centre	0·54	7·97	15·83	15·83
Port Germein	0·68	8·46	12·11	12·84
Wirrabara	1·07	15·20	18·07	18·91
Appila	0·98	8·85	14·11	15·08
Cradock	0·99	8·01	10·18	10·86
Carrieton	0·90	7·63	11·34	12·22
Johnburg	1·05	7·36	9·46	10·21
Eurelia	1·17	6·99	13·24	13 24
Orroroo	1·30	8·22	12·70	13 42
Black Rock	1·00	7·97	11·49	12·25
Petersburg	0·57	9·21	12·22	13·07
Yongala	0·60	8·48	13·04	13·94
NORTH-EAST.				
Ucolta	0·67	6·12	—	—
Nackara	0·69	7·30	—	—
Yunta	0·56	6·89	7·68	8·22
Waukaringa	0·70	6·51	7·36	7·94
Mannahill	0·15	9·23	7·83	8·46
Cockburn	0·20	4·45	7·45	7·97
Broken Hill, NSW	0·35	4·69	8·83	9·62
LOWER NORTH.				
Port Pirie	0·52	9·16	12·55	13·21
Port Broughton	0·83	10·65	13 73	14·33
Bute	0·45	13·82	14·81	15·42
Laura	0·96	13·37	17·35	18·22
Caltowie	0·88	12·88	16·32	17·27
Jamestown	1·22	13·38	16·47	17·46
Gladstone	0·65	12·42	15·24	16·00
Crystal Brook	1·47	11·50	14·82	15·62
Georgetown	1·32	15·27	17·42	18·32
Narridy	0·98	9·69	16·00	16·79
Redhill	1·05	11·84	16·07	16·79
Spalding	0·88	14·71	19·36	20·25
LOWER NORTH—*continued.*				
Gulnare	1·09	12·88	19·00	19·74
BundaleerW.Wks.	0·98	12·40	16·34	17·29
Yacka	0·93	11·07	14·56	15·27
Koolunga	0·85	10·83	15·11	15·94
Snowtown	0·66	10·68	15·06	15·70
Brinkworth	0·84	13·76	14·78	15·48
Blyth	0·94	13·57	15·63	16·34
Clare	1·17	21·01	23·37	24·30
Mintaro Central	0·97	16·43	21·08	21·99
Watervale	1·80	24·09	26·06	27·17
Auburn	1·21	17·51	23·27	24·25
Hoyleton	0·95	12·34	17·17	17·96
Balaklava	0·54	10·60	16·63	16·03
Port Wakefield	0·39	9·75	12·57	13·13
Terowie	0·57	8·64	12·72	13·71
Yarcowie	0·65	11·18	13·10	13 91
Hallett	0·72	12·84	15·50	16·40
Mount Bryan	0·57	14·77	15·05	15·73
Burra	0·69	13·74	16·99	17·82
Farrell's Flat	0·97	13·65	18·07	18·87
WEST OF MURRAY RANGE.				
Manoora	1·09	14·38	17·17	18·09
Saddleworth	1·14	16·06	18·80	19·69
Marrabel	0·89	14·43	18·11	18·94
Riverton	1·18	16·51	19·68	20·48
Tarlee	1·00	15·36	16·66	17·48
Stockport	1·34	16·44	15·16	15·89
Hamley Bridge	1·04	15·19	15·61	16·45
Kapunda	1·52	18·49	18·78	19·67
Freeling	1·89	19·68	17·03	17·85
Greenock	2·20	19·99	20·44	21·46
Truro	2·84	23·60	18·84	19·74
Stockwell	1·89	17·82	19·33	20·30
Nuriootpa	1·84	16·42	20·20	21·25
Angaston	1·38	21·35	21·18	22·25
Tanunda	1·62	22·48	21·31	22·28
Lyndoch	1·25	19·08	22·07	23·01
ADELAIDE PLAINS.				
Mallala	1·08	14·40	16·10	16·88
Roseworthy	1·54	14·70	16·53	17·31
Gawler	0·96	15·62	18·37	19·21
Two Wells	0·96	11·65	15·64	16·36
Virginia	0·60	12·82	16·77	17·58
Smithfield	0·78	15·05	16·54	17·30
Salisbury	1·12	15·07	17·81	18·57
North Adelaide	1·27	17·95	20·49	21·49
Adelaide	1·36	15·72	20·10	21·04
Brighton	1·34	15·55	19·02	19·93
Glenelg	1·13	14·41	17·52	18·35
Magill	1·60	17·54	24·53	25·69
Glen Osmond	1·37	20·07	24·15	25·20
Mitcham	1·17	18·26	22·52	23·47
Belair	1·43	20·83	27·52	28·64

RAINFALL—*continued.*

Station.	For Nov., 1913.	To end Nov., 1913.	Av'ge. to end Nov.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.				
Houghton	—	—	—	—
Teatree Gully	1·00	19·17	27·01	28·19
Stirling West	2·24	33·34	44·88	46·70
Uraidla	2·48	30·22	42·59	44·35
Clarendon	1·72	22·56	32·26	33·67
Morphett Vale	1·01	16·17	22·36	23·32
Noarlunga	1·59	13·76	19·51	20·28
Willunga	1·61	19·84	25·07	25·98
Aldinga	1·23	15·66	19·47	20·34
Normanville	1·03	14·99	19·89	20·65
Yankalilla	1·30	18·76	21·91	22·78
Cape Jervis	1·16	11·72	15·71	16·34
Mount Pleasant	1·60	22·70	25·89	26·87
Blumberg	1·28	19·36	28·26	29·38
Gumeracha	1·56	25·93	32·01	33·30
Lobethal	1·20	24·59	34·13	35·38
Woodside	1·16	24·72	30·73	31·87
Hahndorf	1·31	27·15	34·16	35·45
Nairne	1·14	20·54	27·78	28·83
Mount Barker	1·49	25·23	29·76	30·93
Echunga	1·84	25·71	31·64	32·83
Macclesfield	1·14	25·08	29·64	30·72
Meadows	1·00	28·76	34·26	35·52
Strathalbyn	0·69	18·82	18·52	19·28
MURRAY FLATS AND VALLEY.				
Wellington	0·88	13·18	14·25	15·01
Milang	0·80	10·02	15·44	16·08
Langhorne's Bdge	0·61	11·71	14·53	15·27
Tailem Bend	1·11	12·92	—	—
Murray Bridge	0·40	16·38	13·58	14·32
Callington	0·40	13·72	14·94	15·65
Mannum	0·51	10·13	11·14	11·67
Palmer	0·67	14·78	14·91	15·60
Sedan	0·73	13·47	11·33	11·92
Blanchetown	0·41	7·23	10·06	10·71
Eudunda	1·06	16·68	16·44	17·33
Sutherlands	0·53	10·08	9·99	10·60
Morgan	0·19	6·56	8·57	9·29
Overland Corner	0·54	11·13	10·61	11·42
Renmark	0·18	11·32	10·13	10·93
Loxton	0·52	—	—	—
WEST OF SPENCER'S GULF.				
Eucla	0·03	6·49	9·74	10·13
White Well	0·10	6·65	9·11	9·67
Fowler's Bay	0·17	10·05	11·87	12·11
Penong	0·28	8·99	11·57	11·93
Murat Bay	0·17	9·66	—	—
Smoky Bay	0·55	10·98	—	—
Streaky Bay	0·29	10·80	14·95	15·31
Port Elliston	0·35	9·04	16·08	16·49
WEST OF SPENCER'S GULF—*continued.*				
Port Lincoln	0·89	12·17	19·28	19·88
Tumby	0·26	10·90	14·54	15·00
Carrow	0·58	10·49	—	—
Cowell	0·64	9·04	11·29	11·76
Point Lowly	0·87	7·13	15·60	12·21
YORKE'S PENINSULA.				
Wallaroo	0·58	12·68	13·53	14·05
Kadina	0·52	11·67	15·33	15·88
Moonta	0·66	13·00	14·62	15·22
Green's Plains	0·44	11·97	15·24	15·73
Maitland	1·15	14·32	19·36	20·08
Ardrossan	1·07	13·11	13·38	13·89
Port Victoria	1·08	11·84	14·63	15·20
Curramulka	0·56	14·11	17·90	18·51
Minlaton	1·01	12·73	16·85	17·41
Stansbury	0·69	13·76	16·51	17·06
Warooka	1·39	12·37	17·15	17·71
Yorketown	1·01	12·29	16·89	17·47
Edithburgh	0·90	14·11	15·89	16·48
SOUTH AND SOUTH-EAST.				
Cape Borda	1·38	17·25	24·33	25·09
Kingscote	1·18	14·44	18·23	18·95
Penneshaw	1·35	15·12	20·54	21·34
Cape Willoughby	2·08	17·27	18·88	19·69
Victor Harbor	1·57	14·50	21·35	22·18
Port Elliot	1·08	13·95	19·56	20·33
Goolwa	1·27	13·44	17·22	17·93
Pinnaroo	0·90	12·93	15·80	16·74
Parilla	0·89	12·88	—	—
Lameroo	1·08	17·08	15·59	16·55
Parrakie	0·85	11·77	—	—
Geranium	1·05	14·68	—	—
Peake	0·99	14·59	—	—
Cooke's Plains	0·94	13·41	13·98	14·74
Meningie	2·46	14·26	18·04	18·87
Coonalpyn	1·95	16·50	16·55	17·49
Tintinara	1·77	14·13	17·61	18·78
Keith	1·73	17·84	—	—
Bordertown	1·33	17·29	18·62	19·76
Wolseley	1·12	16·52	16·84	17·72
Frances	1·22	15·85	19·47	20·74
Naracoorte	2·19	17·92	21·50	22·60
Penola	2·13	17·58	25·39	26·78
Lucindale	2·06	15·40	22·13	23·32
Kingston	1·85	17·46	23·52	24·73
Robe	1·47	17·02	23·68	24·69
Beachport	1·50	20·36	26·42	27·51
Millicent	1·68	23·74	28·01	29·25
Mount Gambier	1·90	23·59	30·23	32·00
C. Nrthumberland	1·23	18·06	25·40	26·63

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.	
		Dec.	Jan.
Amyton	*	—	—
Angaston	*	13	10
Appila-Yarrowie	*	—	—
Arden Vale & Wyacca	*	—	—
Arthurton	625	—	—
Balaklava	*	—	—
Bandon	†	—	—
Beetaloo Valley	621	—	—
Belalie North	*	13	10
Berri		13	10
Blackwood	637	8	12
Blyth	‡	20	17
Booleroo Centre	*	—	—
Borrika	*	—	—
Bowhill	*	—	—
Burra	‡	12	9
Bute	†	—	—
Butler	*	—	—
Caltowie	*	13	10
Canowie Belt	*	—	—
Carrieton	*	11	8
Cherry Gardens	‡	9	13
Clanfield	*	—	—
Clare	*	12	9
Clarendon	*	8	12
Claypan Bore	631	—	—
Colton	*	13	10
Coomandook	633	—	—
Coomooroo	†	13	—
Coonalpyn	633	—	—
Coonawarra	*	—	—
Coorabie	627	13	—
Cradock	*	—	—
Crystal Brook	*	—	—
Davenport	*	—	—
Dawson	‡	—	—
Dingabledinga	*	12	9
Dowlingville	†	—	—
Elbow Hill	*	—	—
Forest Range	634	11	8
Forster	†	—	—
Frances	*	12	9
Freeling	*	—	—
Friedrichswalde	*	13	—
Gawler River	*	—	—
Georgetown	623	13	10
Geranium	*	27	31
Gladstone	622	—	—
Glencoe	*	—	—
Goode	628	—	—
Greenock	*	—	—
Green Patch	628	8	12
Gumeracha	*	9	13
Hartley	‡	10	7
Hawker	*	8	12
Hookina	*	9	13
Inman Valley	634	—	—
Ironbank	636	12	9
Julia	623	13	—
Kadina	*	9	13
Kalangadoo	*	13	10
Kanmantoo	636	13	10
Keith	*	13	10
Kingscote	*	2	6
Koppio	628	11	—
Kybybolite	*	11	8
Lameroo	*	—	—
Leighton	*	—	—
Lipson	*	—	—
Longwood	*	10	7
Loxton	*	—	—
Lucindale	†	20	17
Lyndoch	‡	11	—
MacGillivray	637	—	—
Maitland	626	4	1
Mallala	624	1	5
Mangalo	629	13	—
Mannum	*	27	31
Meadows	‡	9	13
Meningie	636	13	10
Millicent	‡	9	13
Miltalie	639	13	10
Minlaton	620	11	8
Mitchell	630	13	10
Monarto South	633	13	—
Monteith	*	—	—
Moonta	*	—	—
Moorlands	*	—	—
Morchard	*	13	—
Morgan	634	13	—
Morphett Vale	637	—	—
Mount Barker	*	10	7
Mount Bryan	*	13	10
Mount Bryan East	*	6	3
Mount Gambier	637	13	—
Mount Pleasant	‡	12	16
Mount Remarkable	†	10	7
Mundoora	*	—	—
Myponga	‡	—	—
McNamara Bore	*	—	—

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Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings	
		Dec.	Jan.			Dec.	Jan.
Nantawarra	624	10	7	Sherlock	*	—	—
Naracoorte	639	13	10	Spalding	*	—	—
Narridy............	*	—	—	Stockport	*	—	—
Narrung	†	—	—	Strathalbyn	†	—	—
North Booborowie ..	622	—	—	Sutherlands	‡	—	—
North Bundaleer	623	—	—	Tarcowie	†	9	13
Northfield..........	525	2	6	Tatiara	*	6	3
Orroroo	*	—	—	Tintinara........ ...	*	—	—
Parilla	‡	—	—	Two Wells	625	—	—
Parilla Well	*	—	—	Uraidla and Summert'n	‡	—	—
Parrakie	†	6	3	Utera Plains	*	13	10
Paskeville..........	*	11	8	Waikerie	*	—	—
Penola	†	6	3	Warcowie..........	*	—	—
Penong	†	13	10	Watervale	*	—	—
Petina	†	—	—	Wepowie	‡	—	—
Pine Forest	‡	9	13	Whyte-Yarcowie....	*	—	—
Pinnaroo	*	—	—	Wilkawatt	633	—	—
Port Broughton	*	12	9	Willowie	*	5	2
Port Elliot	‡	20	17	Willunga	*	6	3
Port Germein	623	—	—	Wilmington	621	10	7
Port Pirie	*	—	—	Wirrabara..........	621	13	—
Quorn	†	—	—	Wirrega	‡	27	—
Redhill	*	9	13	Woodside	*	—	—
Renmark	*	—	—	Wynarka	634	—	—
Riverton	*	—	—	Yabmana	*	—	—
Roberts and Verran..	630	—	—	Yadnarie	*	—	—
Saddleworth........	*	19	16	Yallunda	*	—	—
Salisbury	*	2	6	Yongala Vale	*	8	12
Shannon	*	—	—	Yorketown	*	13	10

* No report received during the month of November. † Formal report only received. ‡ Held over.

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ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

January 14th and February 11th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

WIRRABARA (Average annual rainfall, 18·91in.).

November 15th.—Present: 24 members.

Hay-Making.—In a paper under this heading Mr. E. Hollett advised farmers to have everything in readiness before commencing their hay-harvesting. The hay should be stooked close behind the binder, which would prevent it becoming bleached. Good wheats for hay were Lotts, Baroota Wonder, Yandilla King, and Silver King. However, if the farmer chaffed his hay it was a better policy to grow wheats which were suitable for grain. The crop should not be cut until the flag at the bottom of the straw had dried off. The stack should be built on a floor of solid timber or straw; hollow timber provided a harbor for mice, &c. The round-cornered stack was best. It should be kept fairly full in the middle. He preferred building a false roof, starting a short distance in from the edge of the stack, *i.e.*, about the length of one sheaf, and filling the centre well. A start should then be made at the outside of the eaves with the roof, the best sheaves, head outwards, being used. After harvest a protecting covering of straw should be put on the stack. Members favorably mentioned roofing with galvanized iron fixed with specially made screws; this was very simple and effective.

WILMINGTON, November 12th.—It was decided that the Branch should conduct experimental wheat plots on the lines suggested by the committee appointed by the Congress to consider the matter of practical work for the Bureau.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

October 20th—Present: seven members and three visitors.

Marketing Produce.—Mr. J. Joyce contributed a paper on this subject, in which he stated that produce must be placed on the market in good condition and in an attractive package if it was to command the best prices. An inferior article tastefully presented would often obtain a more ready sale than a superior article poorly marketed. Wool for market should be free from dirt, grass seeds, &c. The presence of this might mean a loss of ½d. or ¼d. per pound. A large amount of dirty wheat was marketed, especially, he thought, since the introduction of the harvester.

Breeding Lambs for Market.—Mr. A. Woolford contributed a paper on this subject, in which he advocated obtaining young Merino ewes, say four-tooth, of good frame and crossing them with a Shropshire ram. If the ewes lambed early, say in April, with good feed the lambs should be ready for the early markets. From this cross big lambs with good wool should be obtained which should do well and fatten quickly. He had found this district very suitable for sheep. There was a good average rainfall and a good supply of grass, which kept green nearly all the year. The locality was also suitable for wool-growing, the wool being heavy and greasy. He advised growing lucerne for topping off. Cattle were not so profitable as sheep. Mr. F. Bartrum considered this district unsuitable for lamb-raising, as the holdings were too small and feed was always late. With regard to the quality of the wool grown Mr. Murphy stated that his experience had shown it to be very fine and free from grease. He recommended sowing barley for early feed for ewes and lambs, which would easily repay the expense of the crop.

GLADSTONE (Average annual rainfall, 16in.).

November 15th.—Present: 19 members and four visitors.

Dairying.—Mr. R. A. Humphris read a paper. With the closer settlement of the Murray Flats, he said, there seemed to be a reviving interest in dairying. The dairyman was advised to provide ensilage and stacked fodder for use in the winter months or in dry seasons. Iron milking sheds, with cement floors and fitted with bails, were best. A milking machine and separator were necessary, and a Babcock tester should complete the plant. He preferred the Shorthorn cows, as they made better beef when they had served their purpose as milkers, than the lighter breeds. The Holstein was the best milk producer. Good milk lines, broad hips, wedge-shaped body, tapering to a fine thin head, fine horn and tail, well-set udder and quarters were indications of quality in a cow. The practice of testing the herd was strongly recommended, and the method of carrying this out explained. Pigs should be kept and calves fattened. A few veterinary appliances, such as a milk fever outfit, should always be on hand.

NORTH BOOBOROWIE (Average annual rainfall, 16·35in.).

October 16th.—Present: 14 members and two visitors.

Poultry Breeding and Rearing.—Mr. W. F. Hannaford read a paper on this subject, as follows:—"Having decided to keep poultry, our first consideration should be housing. It is not necessary to build an elaborate house. It should be warm, dry, free from draughts, but allow of plenty of fresh air. A good serviceable one can be built of wood and galvanized iron, the size being about 10ft. long, 8ft. wide, and 5ft. 6in. high in front and 6ft. at the back. The back and sides should be enclosed with small-fluted iron, the roof of the same material, with one sheet along the front lengthways; the remainder should be enclosed with wire netting. The perches should be from 12in. to 18in. from the ground and movable for convenience in cleaning. All timber should be tarred to keep out vermin. I would strongly recommend using only pure-bred typical male birds. It may not be possible for one to have all pure to start with, but the males should not only be pure but the best that one can afford to buy. While admitting that some great records have been put up by White Leghorns, I wish to point out that some very low figures have been made by the same variety. Take, for instance, the present competition. The leading pen of White Leghorns have laid 764 eggs, while the lowest pen of White Leghorns have only laid 330 eggs. It is not the breed so much as the 'strain' that one must look to when buying. At the same competition we find Black Orpingtons have laid 700 eggs and Silver Wyandottes 565 eggs. I therefore advocate the dual purpose fowl that will lay a fair number of eggs during the year, rear a clutch of chickens if required to do so, and when it has served its purpose on the farm make a good joint when placed on the table, or give a payable return when sent to market. I have decided to keep Black Orpingtons of an approved strain, with Silver Wyandottes as my second choice. The morning meal should consist of boiled scraps from the house thickened with pollard. All birds confined to pens should receive finely-chopped green stuff at mid-day, and at evening good sound grain should be scattered in straw or some other litter. Fresh water must always be available. For heavy breeds the best time to hatch is the latter end of August up till September and the early part of October. Pullets hatched during that period will lay in time to catch the Lenten season and before the cold weather sets in, and should lay all through the winter, thus catching the best markets. If hatched too early they will moult in the autumn and may not lay through the cold months. I prefer putting eggs under a hen for 18 or 19 days, then removing them into an incubator to complete the hatch, rearing the chicks in the brooder. Hand-reared chicks do better and are more docile. If hatching under hens one must be careful to see that the broodies are free from vermin and scaley legs, or there will be trouble with the young stock. Another method of hatching is by means of the incubator entirely, and each maker supplies full directions with each machine. For the first week the chicks should be fed on hard-boiled eggs and bread crumbs. The second week they may have fine cracked grain, the size being gradually increased as the chicks come on. If they are reared in a brooder it must be cleaned and well aired daily and plenty of fine chopped green feed and good grit must be supplied each day. If the females run at large a pen with a house attached should be erected in which to place the male birds when the breeding season is over, and also to put the cockerels in as soon as they begin to crow. The hens and pullets will lay quite as well alone, and infertile eggs keep better. The cockerels will fatten better when confined, and will realise better prices than when allowed to roam at large. In this locality, where the holdings are small and lucerne or other fodders can be grown successfully, poultry-breeding must play a very important part on our farms. Our revenue for the year can be greatly increased if we pay the attention to our fowls which they deserve." Members generally agreed with the ideas expressed in the paper. Some, in order to secure eggs the whole year round, made a practice of hatching chickens in the autumn as well as in the spring.

PORT GERMEIN (Average annual rainfall, 12·84in.).

October 18th.—Present: 11 members and four visitors.

Feed for Stock.—Mr. Holman contributed a paper. In this district, in an ordinary season, he said, a landholder might run a number of sheep or cattle sufficient for the carrying capacity of his land, but in a wet and early season the same number would be useless to keep down even the weeds on his fallow. Farmers have been blamed for neglecting to conserve fodder in seasons of plenty, but the requirements of the ordinary working stock during a period of drought extending over, say, three years would tax to the utmost all provision in this regard. It was profitable to purchase growing cattle of one or two years of age, as their value increased even if they were not fattening. He doubted whether sheep would pay as well as cattle, as dogs were troublesome in the Flinders Range. In the discussion which followed Mr. Hacket said fodder could not be conserved in these dry areas and feed could not be left in the paddocks. Mr. Carmichael mentioned that stacks of cocky chaff and straw were at one time plentiful, but now there were few stacks of hay, even in favored districts. Several members thought farmers had been improvident in this regard.

Cows *v.* Sheep on the Farm.—In a paper on this subject Mr. Stone favored sheep, as they were less trouble. Where suitable labor was available cows could be kept at a profit. The milk should be weighed and tested, and the unprofitable animals culled out. He would not keep a cow of more than 8 years of age, as after that the milk yield and the percentage of butter fat decreased. He preferred the Merino sheep, which were less troublesome with the fences. They were hardy and capable of withstanding a dry season. Sheep were of great value in cleaning fallow, especially of oats and mustard. Messrs. N. Ragless and Hillam preferred crossbreds for lambs and Merinos for wool.

GEORGETOWN, November 13th.—Marketing Wheat.—Mr. Page read a short paper under this heading He advised farmers not to accept storage notes for their wheat, but to sell it outright, and thus ensure competition.

NORTH BUNDALEER, November 12th.—Preparations for Harvest.—Mr. J Scriven read a short paper advising members to overhaul their harvesting machinery at such time as to obviate delay when the harvest was ready. The estimated requirement of cornsacks should be ordered as early as possible.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

JULIA (Average annual rainfall, 18in. to 19in.).

October 11th.—Present: 16 members and 18 visitors.

Parturient Apoplexy, or Paralysis.—In an interesting and instructive paper on this subject, a visitor explained that this disease only attacked milk cows, those most subject to the trouble being heavy milkers in a high state of nutrition. The disease usually appeared within 24 hours after parturition, generally following an easy birth. At the outset the affected animal manifested uneasiness, moved about in a restless manner, struck at the abdomen with its hind legs, probably bellowed, ground the teeth, with possibly spasms of groups of muscles, or even a general convulsion. After these, the cow showed weakness, staggered, and fell. As the paralysis advanced, it stretched on its side on the ground, usually with the neck bent to one side, bringing the nose into the flank or costal region. The animal was in a state of partial or complete unconsciousness

Digestion was arrested, fermentation sets in, and the beast became affected with flatulency The contents of the rectum and colon were hard and dry, and might be covered with mucous or blood. The animal was unable to pass the urine, the pulse was small, often imperceptible. Without treatment the disease usually ran rapidly to a fatal issue. It was necessary to carefully distinguish between this trouble and anti-partum paralysis, and broken back. Preventive treatment consisted of moderate feeding, especially of grain, in the later stages of gestation. The bowels should be kept in good condition by the administration of magnesium sulphate, sodium chloride, and sodium bicarbonate. The afterbirth should be removed soon after parturition, and an injection given. The curative treatment recommended by Schmidt consisted of the thorough disinfecting of the hands of the operator and the udder and teats of the cow by washing with a 5 per cent. solution of carbolic acid, or 1½ per cent. of lysol. The apparatus, consisting of a small glass or nickel funnel and a rubber hose, should be sterilized immediately before it was used. The tube should be inserted into the teat, and a continuous flow of sterilized air pumped into the udder. After the quarter was well distended the tube should be withdrawn, and the teat tightly tied with a piece of tape, to prevent the escape of the air. The udder should then be gently massaged upwards towards the body. The tapes should be removed two hours after the cow was on her feet, the air and milk being milked out 24 hours afterwards, if recovery were assured. The animal should be without feed for this time, and should then be given only small quantities at a time. Lukewarm water only should be allowed. The urine should be removed with the catheter at intervals until this procedure became unnecessary. As the animal was generally unable to swallow, it was dangerous to attempt to administer medicine through the mouth. One ounce to 1½ozs. of aloes might be given through a probang inserted into the stomach. Rectal injections, consisting of linseed oil, cotton seed oil, or warm soap solution were necessary at intervals. The animal should be propped up and thickly covered with blankets and straw If improvement were not marked within eight hours, the treatment should be repeated. The paper then described cases where the writer had successfully carried out the treatment recommended.

MALLALA (Average annual rainfall, 16·88in.).

November 3rd.—Present: 11 members and two visitors.

Roseworthy Agricultural College.—On October 27th, 12 members and 11 visitors journeyed to the Agricultural College, Roseworthy. A comprehensive inspection of the institution was made, and the visitors were much impressed with the work being done there.

Pea-Growing.—Mr. J. J. McCabe read a paper on this subject. It was necessary, he said, to keep sheep for the purpose of cleaning the fallow, and he advocated growing this crop to tide the animals over the summer months, when feed was scarce. He had sown 16 acres with barley the previous year and had fed it off bare. He ploughed it with the first rains of the season, then harrowed and allowed it to lie out until after seeding. He cultivated the land to the depth that it was ploughed, after a good rain in August and drilled in the peas at the rate of a bushel to the acre, 100lbs. of super. being applied; he then harrowed the land again. The crop was too thin and did not mature properly. He raked up a few small wagon loads in the first week in January and obtained four bags of peas; eight cows and 150 ewes were then turned in. The cows were taken out after two weeks but the ewes remained until March, when the paddock was as clean as fallow land. The sheep were in prime condition. Oats which had been sown on this land looked as well as those on fallow. In reply to questions Mr. McCabe said that 2bush. was the best quantity of peas to sow to the acre, and 100lbs. of manure should be applied. He would sow about the middle of June. It was not necessary to roll the crop unless it was intended to gather the peas. Several members had tried this crop this season for the first time.

NANTAWARRA (Average annual rainfall, 15·90in.).

November 13th.—Present: seven members.

Fodders.—Mr. A. F. Herbert read a paper. A stack of straw, preferably oat or barley, sprinkled with salt, he said, was a valuable standby in case of shortage of feed. Mixed with a little crushed grain, this would even make a suitable feed for working stock. Chaffed pea straw also was good. Pigs and sheep did well on the peas. Early sown barley provided a good supply of greenfeed as well as grain if properly managed. Algerian oats drilled in early with super. on stubble, cultivated, then harrowed after the drill, yielded good feed. The farmer who had an engine was advised to procure a small header, bind portion of his crop, and after threshing, stack the straw. Young horses and cattle would thrive on this, especially if it were chaffed. Cocky chaff, also, was not to be despised. Mr. Sleep agreed with the remarks of the writer of the paper. Mr. Smith recommended sprinkling straw that was being stacked with a solution of salt and water. Algerian oats should be sown on stubble land worked with the cultivator. Cocky chaff was not worth saving. Mr. Sutton strongly advised stacking straw. A stack he had cut with the binder had been disposed of at a very satisfactory price. He had planted a small area with peas and turned the stock in. The peas still continued to grow, and some must have matured, as each year plants appeared. He had tried dry salt on straw with indifferent success, but when the salt had been applied in a damp state it had all been absorbed. Mr. R. D. Nicholls thought cocky chaff well repaid the extra trouble expended in obtaining it. He favored growing peas, and had found that pigs and stock were partial to and did well on them. Horses required a certain amount of bulk food, therefore the feeding of too highly concentrated food should be avoided. In reply to questions Mr. Herbert stated that crushed oats were more easily digested than whole. They mixed well with the feed and adhered to the chaff. He had not noticed a great difference between the Algerian and Calcutta Cape oats, but had sown Algerian for several years with thoroughly satisfactory results.

NORTHFIELD (Average annual rainfall, 19in.).

November 4th.—Present: Seven members and one visitor.

Farm Management.—Mr. J. Williams read a paper. The farmer needed a good knowledge of sheep, he said, as these were indispensable on the farm. He preferred the Merino ewe, if of large frame, because of its fleece, and as, if mated with a Shropshire ram, it would produce a fair export lamb. The Merino-Lincoln first cross ewe produced a less valuable fleece, but this was made up for in the value of the lamb when she was mated with either a Shropshire, Southdown, or Dorset Horn ram. The Border Leicester ewe produced a good fleece, and when crossed with a Shropshire ram yielded a first quality lamb. The sheep helped to keep the land clean, and improved it by their droppings. No farmer should be without two or three dairy cows. The Jersey-Milking-Shorthorn cross was the most profitable. They produced large quantities of rich milk, were hardy and could be fattened for beef. The calves also sold well for veal. The Clydesdale was the best horse for the farm. Generally, early fallow, well worked, was the safest method of cultivation. The ploughing should be deep and subsequent working shallow

TWO WELLS (Average annual rainfall, 16·36in.).

November 15th.—Present: 14 members and one visitor.

Petrol and Oil Engine.—Mr. L. H. Dawkins read a paper. Farmers were not acting wisely, he said, in buying petrol engines, as their management required greater skill than that necessary for the oil engine. Petrol was more expensive than oil, the petrol engine was more complicated in construction, and the number of revolutions per minute was greater than in the case of the oil engine. The engine purchased should always be capable of easily performing the work required of it. With oil engines trouble was generally due to starting the engine before it was thoroughly heated, or neglecting to clean the vapouriser. The oil engine ran more smoothly, had larger bearings, crank, and a longer piston than the petrol engine. Mr. R. Kenner thought the majority of petrol engines simple to manage. A reserve power was always necessary. Mr. A. J. Baker mentioned the danger of fire with oil engines. Members generally favored the petrol-driven engine

YORKE PENINSULA DISTRICT.

(TO BUTE.)

ARTHURTON (Average annual rainfall, 16in. to 17in.).

November 5th.—Present: 12 members.

Harvest Prospects.—An inspection of crops in the district had revealed a remarkable change for the better during the past few weeks.

Fallow.—Mr. T. H. Howlett read a paper, in which he said the farmer should observe variations in the nature of soil on the farm and adjust his methods of cultivation accordingly. For fallowing land for grain crops he preferred summer working, which would loosen the surface and encourage the germination of weed seeds. Immediately seeding operations were completed the fallow, if heavy land, should be ploughed to a depth of 3in. or 4in. and harrowed as soon as possible, across the ploughing for preference. After the first working the mouldboard plough should be kept out of the fallow. In loose rubble or sandy soils the cultivators could be used. The harrows should be put over the ground after rain, and sheep should be used to keep the weeds down. In the event of the surface still being rough and lumpy in places it should be broken down with a land roller and harrowed immediately. When there was a great deal of fallow to be gone over in a limited time a heavy set of harrows would be found very serviceable. On several occasions he had noticed land ploughed in March or April and cropped with an early variety of wheat had yielded 20bush. per acre, whilst bare fallow had yielded 25bush. In his opinion the former was the more profitable, as the cost of working was considerably less, and the landholder could carry a greater number of sheep. Autumn fallow greatly reduced the danger of drift in light soils. If oats and barley were drilled into this class of soil immediately after a wheat crop, and the crops were heavily fed off by stock, the fertility of the soil would be greatly improved. Barley was preferable to oats, as stock took to it more readily, and it gave much more feed in the winter months. His experience was that it did not impoverish the soil for the wheat crop following. Experiments should be conducted with the object of determining the fodders which would yield the most summer feed for sheep. Unproductive patches of soil should be analysed to determine the constituent which was lacking in quantity. Different manures should be tried. Mr. Short advocated the use of the roller for packing the soil. The Hon. Secretary concurred, but also recommended the frequent use of the harrows.

MAITLAND (Average annual rainfall, 20·08in.).

November 1st.—Present: 10 members.

FALLOWING.—The Hon. Secretary read a paper on this subject, in which he said that the principal reason for fallowing was to conserve moisture. At the same time rubbish, which was plentiful in this district, was destroyed. Land to be fallowed should be turned up as early as possible in the season in order to get the benefit of early rains. He favored shallow ploughing for the first working, as the land worked down much finer and weed seed was not buried too deeply. Under ordinary conditions and average rainfall, when the farmer had completed the first working that on which he had commenced would be ready for the second cultivation. Following this the land should be gone over with harrows that would leave the surface as smooth as possible. Rubbish grew much better when the surface was well worked down, provided the seed was not buried too deep. This should be fed off to sheep and the land ploughed again. In this district fallowing should not exceed a depth of 3in. About the first week in October the land should be harrowed crosswise to the ploughing with heavy harrows. This would discourage the appearance of strips of a green tinge in the paddocks, caused by rain falling while the ploughing back was in progress. The shallower the land was worked the less these would be noticed, as the rubbish dried up more quickly. After this, under ordinary conditions, the first paddock ploughed would be ready for the third working. The land should be harrowed again if possible. If rain fell during the summer it should be ploughed as soon as harvesting was completed. In the absence of rain, however, working with weighted harrows would be of value. He asserted that well-worked fallow in an ordinary season conserved moisture equal to 3in. of rain. When seeding the depth of working should not exceed 2in., as the land was fairly free and there was a tendency for the seed to go in too deep. He would use a plough of not less than 10 furrows. If the working were done shallow at first and the depth gradually increased one horse to each furrow would do the work fairly comfortably. For shallow working he preferred a plough that cut a narrow furrow, say, not more than 7in. More furrows were better than an over-wide cut. Members generally agreed with the writer of the paper.

MINLATON (Average annual rainfall, 17·46in.).

October 18th.—Present: 11 members.

FALLOWING.—In a paper on this subject Mr. S. Vanstone said that land should not be ploughed when dry and hard if this could possibly be avoided. It required more horse power and extra labor to work it down to a fine seed bed. On the other hand if well soaked the soil would work down finely and moisture was easily retained. It was a mistake when ploughing to turn the soil out toward the fence each time and thus create an unsightly bank. During the first round it was advisable to keep the fence about eight yards distant on the left hand side, and afterwards reverse the direction, leaving the narrow strip near the fence until last. When the land was ploughed again it should be turned toward the fence from the start. For land clear of straw or rubbish he preferred a plough cutting not more than 6in. furrows. An eight-furrow plough with a 6in. cut worked the land much better than a six-furrow plough with an 8in. cut, and the draught was no greater. The very light soils in this district were not improved by deep ploughing, and it was not advisable to work the land to the same depth each year. The headlands should be turned outwards the first ploughing and inwards the second. This tended to keep the surface more even. It should be harrowed as soon as possible after ploughing. Land fallowed early in the season, say in June or July, was much benefited by frequent harrowings, and if the weeds could be kept down only harrowing would be required until seeding. Fallow should only be worked deep enough to kill the weeds. In this district the last ploughing before the summer should be from east to west, as the north winds might otherwise cause drift. In the discussion which followed members advocated burning off grass or rubbish on land to be fallowed the following winter, as this practice tended to discourage the development and spread of takeall. Members generally advocated frequent harrowing.

Homestead Meeting.—This meeting was held at the homestead of Mr. J. Martin. Members inspected the crops, which were looking well and had benefited greatly by the recent rains. The stables, chaff and engine rooms were also inspected.

WESTERN DISTRICT.

COORABIE (Average annual rainfall, 11in. to 12in.).

October 11th.—Present: 16 members and 10 visitors.

The Farm Employee.—Mr. V. R. Weston read a paper, in which he said—"In a district like our own it is, in the average season, difficult to obtain suitable labor at an average wage, but I am sure that with attention to the welfare of those we employ we will not only keep the good employés we have but will in time have a bigger supply. Even though we may not have a surplus of men, we cannot be too particular of those we employ. If we only employ the best, then only the best men will apply for employment. In my mind the man we want is he who works, not merely for the sake of earning a living, but who has for his object that of ultimately becoming an employer himself. This class of man is the ideal. He takes more interest in his work and in doing it well, and shows more consideration toward his employer than the man who is merely after his wages. Personally, I would sooner do without a man than have to employ a second-rater. It is indeed poor economy to employ one of these merely because we can get him for a lower wage than a tip-top man, and is something like purchasing an inferior article because it is cheaper than the best, but in the long run it proves the dearest; for this class of man seldom, if ever, takes an interest in his work. There is rather a tendency among some farmers to think that because a man is in their employ he is not entitled to the comforts which he himself enjoys. Perhaps he is not; yet, to my mind, a comfortable home is more likely to produce a feeling in the man that he should do all he could to his employer's interest than otherwise. One cannot, of course, lay down any set hours for work, but in the slack season 8 to 12 hours, according to the length of the days, is long enough; but, of course, during seeding, hay-making, and harvesting operations hours must of a necessity be longer. but I do not think there is any necessity for so-called night work, with the exception of feeding up, and instances where the man has a long trip, such as wheat-carting to port and the return home. I also maintain that during those working hours the employé should be kept going and not allowed time to think of what he is going to be told to do next; for I am certain that idleness is the parent of discontent. There are many ways in which the farmer can make things rather more congenial for his employé, and my previous mention of wheat-carting and similar road work suggested many little points to my mind. For instance, if when the man gets home with the team he has some one to help him unharness, feed, and water them. it will naturally make him feel that his employer has at least a little consideration for him after his tiring work of the road. Then I do not think that an employer should expect his men to do work which, if their positions were reversed, he would not do himself. For instance, after a man has been on the drill or plough all day is it fair to expect him to go on pickling wheat after tea? I do not think so; and yet have repeatedly seen this done, Of course there are exceptions where the employé does not mind doing it, but they are very rare. When an employé makes an error in his work, or fails to do some job which he should have done, do not put off reproval until he repeats his error, but correct him there and then, not in a blustering manner, but quietly show him his mistake and how to rectify it. Then he will know what to do should similar circumstances arise again. It is hard at times for the farmer to keep his temper, but a little of the give and take principle and some consideration for the other man makes things work far more smoothly. In conclusion, I make one suggestion, and that is 'treat your employés well, and they, if they are the class of man you want, will treat you equally well.' " Members thought an occasional Saturday afternoon holiday would go a long way in the direction of maintaining amicable relations between the employer and employé. The farm laborer to-day required a certain amount of experience with machinery. Generally the views of the writer were agreed with.

GREEN PATCH (Average annual rainfall, 26·56in.).

November 10th.—Present: 10 members.

Currants and Pears.—In presenting a report of the Annual Congress Mr. Sage mentioned that as the Australian market for Zante currants had been glutted growers were not now planting this vine. Several growers had made the mistake in planting pears of confining their attention to one or two kinds; as these had not been self-fertilising, poor crops were the result. This fruit did splendidly in this district.

Harvesting Hay and Grain.—Mr. C. Parker contributed a paper on this subject, in which he said that in the event of breakages in machinery not receiving immediate attention a "repairs book" should be kept, in which a note should be made of points requiring attention. His experience had led him to the conclusion that oats for hay should be cut well on the ripe side—when they were a bright amber color. Stooking should follow directly after the binder, the sheaves being placed in long rows four sheaves wide. Hay for market, however, might need to be cut earlier; it was necessary to meet the wishes of the buyer in this regard. In hot weather, with drying winds, from 12 to 15 days was long enough to leave the hay in the stooks; but if the weather were dull and cloudy, without winds, it should remain in the stooks for about three weeks. A good method of determining whether it was sufficiently matured was to extract two or three straws from the centre of the sheaf; if the node had lost its moisture the hay could be stacked with safety. Wheaten hay could be treated in a similar manner, but it should be cut from six to 10 days earlier than oats. On no account should the sheaves be laid flat on the ground, as the hay was likely to be damaged by dampness from the ground. Grain should not be stripped until it was thoroughly ripe and well set. He favored the use of the stripper, especially in this district, where the cocky chaff was so valuable for winter feeding. The motor winnower was most economical when the area to be dealt with was large. The wheat should be marketed in a clean condition. Members thought that until the present system of marketing wheat was altered it would not pay them to make any special effort to produce a clean sample.

GOODE (Average annual rainfall, 12in. to 13in.).

October 16th.—Present: 11 members and four visitors.

Red Rust.—A short paper on this subject was read by Mr. L. V. Hughes. Some years ago he had crops of Federation and Carmichael's Eclipse growing side by side. The former was practically destroyed by rust, whilst the latter was unaffected. This year exactly the reverse was happening. He had noticed that a crop on ground on which the stubble had not been burnt showed signs of rust three weeks earlier than that where the stubble had been destroyed by burning. He was of the opinion that dressings of manure, by encouraging rank growth, were responsible in a large measure for the trouble. Red sandy soil seemed more likely to carry affected crops than titree land, whilst King's Early and Gluyas wheats appeared to withstand the disease better than the later varieties. The Hon. Secretary thought Gluyas the nearest approach to a rust-resisting wheat. Mr. L. Will advised members to select from the crops any heads that were free of rust and plant these for seed.

KOPPIO (Average annual rainfall, 22·40in.).

October 15th.—Present: eight members and two visitors.

The Get-up of Wool Clips.—Mr. W. R. Richardson read a paper, in which he said—"If wool were sold in the same way as wheat there would be no inducement for growers to take trouble in getting up the clip; but as wool is sold at auction and is carefully gone over by the buyers before the sale, the better article is bound to bring the higher price. A fleece is made up of different qualities of wool. For instance, the belly wool is not equal in quality to that from the shoulders and ribs. Again, the wool on the breech is often coarse and of poor quality, and if all this with dirty locks is bundled together we cannot expect the best of the fleece wool to command the price it should. The buyers, if they come across a carelessly got up clip, will always keep on the safe side and rather buy on the lower quality wool than try to average it up and give the price it is worth. The speculative local scourers are always on the lookout for any cheap lots, and a carelessly got up clip is just what they desire. The buyer is very much rushed in valuing the wool before the big sales, and cannot waste time in pulling out a whole lot of wool from the bale to find out exactly what it contains. He will value on what he first pulls, and it is for us to put the wool before him in lots most likely to suit him. The buyers are out here every year, and if they find that a clip of a certain brand has not been honestly got up they will very soon fight shy of that particular brand: but if, on the other hand, they find a brand is always carefully put together they will be on the lookout for it, and will be able to give the best price, simply because they have confidence in it. To get up a clip from a flock of, say, 500 or 600 sheep I should recommend the following:—First, have a perfectly clean floor on which to do the shearing. This must be kept clean, as dirt mixed with the fleece will at once take off that beautiful white lustre that bright clean wool has. For a flock of this size there is not much actual classing required, and any intelligent man who knows anything about wool can do all that is necessary. It is a mistake to make numerous small lots, as they do not command the attention that the larger ones do. I would therefore only make two lots of fleece, and the second lot should only consist of the dirty yellow fleeces or any that would spoil the look of the first lot, perhaps only making a bale or two. If a very broken fleece comes on the table it is best to tear it up and put it with the pieces. The bellies should be picked up as they are taken off and kept separate, and the stained pizzle pieces in the wether bellies should be taken out and put in with the locks. In skirting the fleece only take off the dirty edges and any pieces filled with grass seeds. Sometimes the breech wool is inclined to be coarse and matted, and if so it is as well to take it off. The skirts should be put somewhere separate to be dealt with later. After skirting the sides of the fleece should be doubled over towards the middle and it should be carefully rolled from the breech to the shoulder. We have then different lots of first and second fleece, pieces, bellies, and locks. It is as well to pick the pieces over, as very often in the hurry of skirting dirty pieces get in. These can either be put with the locks or, if sufficient, made into a separate lot and called second pieces. Care should be taken in sewing the bales and branding to make a neat job. The branding should be done in good large print, both on top and on the front of the bale. Brand first fleece, AA combing; second fleece, A combing; first pieces, AA pieces; second pieces, A pieces. I am certain that a properly got up clip will pay handsomely for the trouble taken." In the discussion members agreed that if proper care was exercised the grower benefited. Mr. Newell thought that much good wool was wasted through skirting too deeply, and he also suggested that the question of growers being allowed something for their woolpacks should be brought before Congress next year. Mr. Gardner was of the opinion that it paid the grower to keep the different types of wool separate.

MANGALO (Average annual rainfall, 14in. to 15in.).

October 18th.—Present: 10 members and six visitors.

DISCUSSION.—The following subjects were introduced for discussion at this meeting:—

Marketing of Wheat.—Members considered that the system under which wheat was sold was unjust. The farmer who cleaned his wheat well and obtained a good sample received no more per bushel than those who sold dirty and inferior grain. It was decided to inquire from the various wheat merchants if they would be prepared to give higher prices for well-cleaned samples of high grade wheat.

Spring v. *Bridle Draught Ploughs.*—Members generally agreed that the spring draught ploughs were more suitable than the bridle draught implements for use in hilly country.

Hay-Making.—It was generally thought by members that sheaves should be left half a day before stooking, and from 30 to 45 sheaves should be put into a stook. It should be left 12 to 16 days before carting. The best method of building a stack was to keep the sides plumb, the ends being rounded. The outside sheaves should be placed butts outwards, the heads of the second row being placed out as far as the bands of the outside sheaves, and so on. The centre of the stack should always be kept from 12in. to 8in. higher than the outside, and the roof commenced well over the walls, with the butts outwards and a good slope. Some members, however, recommended placing the heads outwards, as rain ran off better. Mr. Burton, sen. (a visitor), gave some practical hints regarding the building of haystacks.

MILTALIE (Average annual rainfall, 14·55in.).

October 11th.—Present: six members and three visitors.

Care of Horses.—In a paper on this subject Mr. H. Brine said that to ensure the best results too much care could not be taken of the horses on the farm. Working horses should receive four good feeds a day, consisting of a fair-sized dish of chaff and a liberal supply of bran. Too much whole grain should not be given, because of its heating propensities, which tended to cause sore shoulders. For the fourth feed no grist was necessary, enough chaff only being given to create an appetite for the morning feed. Small feeds given regularly were best. The practice of putting enough feed in the manger for the night and morning feeds in order to save time in the morning, was condemned. Each horse should have its own stall, and should be taught to use it. All stalls should be kept thoroughly clean. The animals should not be tied up at night, as they would not secure the necessary exercise or rest, but should be enclosed in a spacious yard containing a straw stack. Each animal should have a well-fitting collar, hames, and winkers. The leather should be kept clean and soft with neatsfoot and castor oils in equal proportions. It should be oiled at least twice a year. Collars should be brushed each morning to remove sweat streaks and caked hair. The horses also should be well groomed each morning. He would not break in foals until they were 2½ years of age, and would then give them light work only until after they were 3 years old. Otherwise they were liable to become misshapen. The Chairman advocated regular feeding. The stables should be kept clean and dry and should be spacious enough to allow the horses to lie down. Mr. A. M. Wilson thought all corn should be crushed before being fed to horses. Members generally agreed with the writer of the paper.

MITCHELL.

November 1st.—Present: 16 members and seven visitors.

Hay-Cutting.—In a short paper on this subject, Mr. D. Green said wheaten hay for feeding as chaff should be cut when the straw was purple at the nodes; hay for long feeding was better cut earlier, say a week after the blossom had fallen. Oats should be left until they were well advanced; they should be chaffed, otherwise the horses would only eat the heads.

Destruction of Rabbits.—Mr. D. Green also read a short paper. He recommended raspberry jam and strychnine for poisoning rabbits, the baits being laid during the months of November, December, and January. Several members thought the poisoning could be continued until May, or when the first rains fell. Mr. Vigars favored digging out the pest. Phosphorus and pollard constituted the best poison for rabbits in rocky country. Mr. Mayhew mentioned that oats dipped in a solution of strychnine and sugar had been used with considerable success. Mr. Jericho recommended trapping.

ROBERTS AND VERRAN.

November 11th.—Present: 12 members and one visitor.

Harvester v. Stripper.—Mr. F. Masters, in a paper on this subject, said the harvester was the best means of dealing with the wheat crop, especially for the small farmer. Less damage resulted to the grain, and there was less chance of loss and waste when it was bagged immediately. This machine was also capable of doing the work much more cheaply than the stripper and winnower, less labor was required, and the work was much more pleasant.

Mr. R. Johnson also read a paper. For the farmer commencing in new mallee country, he said, the stripper was the best machine. The life of the stripper was much longer, there was less trouble with breakages, and the sample turned out was better. There was difficulty in securing labor capable of handling the harvester. As the wheat was left in heaps in the paddocks green leaves and rubbish which might have been collected would have a chance to dry, they would then be more easily removed with the chaff. Mr. W. Sharman, who was using both a harvester and a stripper at the present time, favored the latter, as it enabled him to get the crop off more quickly. The ground was too rough, and the crops rather too light for the profitable use of the harvester.

MANGALO, November 12th—Annual Meeting.—The meeting took the nature of a social gathering. The Hon. Secretary presented his annual report, which showed that the Branch was in a flourishing condition and had accomplished good work during the year

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

CLAYPAN BORE (Average annual rainfall, 16in. to 17in.).

November 11th.—Present: Nine members and two visitors.

Takeall and Oats.—Mr. J. Gray read a paper, in which he said—"Takeall has been the cause of much loss in recent years in many of the old settled as well as the new districts of the State. In this paper, however, I wish to confine myself to the problem as it concerns the development of mallee land. Takeall is a fungus growth known as *Ophio bolus graminis* which attacks the wheat plant near the roots. This fungus has the power of reproducing itself and spreading from one plant to another. Thus it is found spreading in rings, and frequently so rapidly that acres of the crop in places succumb to the disease, and sometimes a promising crop is so reduced by its ravages that there is little left but thistles, wild oats, drake, and other weeds. The seriousness of the problem is realised when the farmer sees a crop of wheat that promises to average 12bush. dwindle down to 2bush. or 3bush. per acre. Of course, I am well aware there are other things that arrest the development of the wheat plant that may be mistaken for takeall, such as grubs, white ants, and root failure. Very often, too, through the crop there will appear a number of white or dead heads, as the ears of the corn fill up and begin to ripen. The cause of this I am not prepared to discuss. The roots of plants affected by takeall will be found dry and brittle, and between the roots and the first node the stem appears black and sooty. The disease did not appear in our own crops until we had put land under cultivation for three years in succession, and then only in small patches. One paddock of 50 acres was sown with wheat three years in succession. This was grazed closely each year. The last year it was so treated, viz., 1911, I noticed what I considered an evidence of takeall, but as the field was fed off, of course the extent of the damage could not be gauged. The following year half the field was sown with Algerian oats and the balance with Golden Drop and Huguenot wheats. It was first ploughed in a dry condition, then worked after the heavy rains in June with a tine cultivator, drilled, and harrowed. The condition for tillage was ideal. The whole field made a splendid start. Later on, however, the disease manifested itself in both varieties of wheat, with the result that the Golden Drop returned about 6cwts. or 7cwts. of hay per acre, and the Huguenot yielded 3bush. of grain per acre. The oats were entirely free of the disease and gave a return of 20bush. per acre. Wheat on the light sandy soil suffered the most. The disease does not seem to spread so rapidly on the stiffer soil, although crops on this kind of land are not proof against takeall. Most of our stiff land receives a shallow working, for the reason that the subsoil is very stiff and considerable pressure is necessary to get the ploughs into it. It may be that the firm land prevents the fungus spreading rapidly from plant to plant. Last year a piece of stiff land, sown with wheat for the fifth time in succession, was ploughed early and dry, then worked after the June rains with a tine cultivator, drilled, and harrowed. This showed many patches of takeall as the wheat matured, but they did not spread to any extent. The yield was 15bush. to 16bush. per acre. Adjoining the 50-acre field already referred to, we have a field of about 180 acres in extent. This is intersected with three fairly large sandhills, one of which runs into the corner of the 50-acre field. From the central hill we took three crops of oats in succession—each crop averaged about 15bush. per acre. The balance of the field carried three successive crops of wheat. The crops on the flats were usually cut for hay. The stubble was burnt off with a fire rake, and the field was fallowed early. This year, while in a moist condition, it was worked with the tine cultivator. Wheat was sown on the hills and on two of the flats, two flats being sown with oats. The whole field started immediately, and for a time gave promise of developing into a very fine crop. When the wheat was well into ear it was noticed that the hill nearest the 50-acre field that suffered so badly last year was rapidly developing the disease. At the present time the average cannot be more than 3bush. per acre. The hill that carried the oats is entirely free of the disease; not even a whitehead is to be seen. It carries a nice even crop of wheat, which I estimate will yield 12bush. per acre; this I regard as a good return for poor white sand. The third hill is badly affected by the disease, but not to the extent of the first hill mentioned. On the central hill one can tell exactly where the oats have been grown. The wheat always suffers most at the foot of the sandhill where the hill runs out to the flat. Another large hill in another field that is now carrying a crop for the fourth time in succession showed signs of the disease last year, consequently this year the hill, the half of which was fallow, was sown with oats. That portion of the crop on fallow is very fine; at the foot of the hill, I should judge the hay cut to be quite 2 tons per acre, and the crop on the hill itself, which is being left to be stripped, at 25bush. of oats per acre. The oats on the adjoining fallowed flat, which is stiff land, are not nearly so good. Judging by the foregoing experience the remedy for takeall appears a very simple one, *i.e.*, take a crop of oats, then fallow the land, and so simply starve out the disease. In the cure, however, it is patent to every farmer that we are up against another problem. If every farmer grows oats on an extensive scale where will the market be found ? Yet, if we do not grow oats, we cannot grow wheat on the light sandy soil. In the first place it is necessary to decide at what figure a bushel of oats can be profitably produced ? After due consideration, in view of the takeall problem, I shall be prepared to sell oats at 1s. 3d. per bushel. The usual price is 1s. 9d to 2s. in Adelaide, and 1s. 9d. per bush in Adelaide means about 1s. 6d. at Parilla. I would rather grow wheat and sell it at 3s. per bushel, but I have to bear in mind that on 'takeall' infested soil I can grow 20bush. of oats, but only 3bush. of wheat. Even if I have to sell the oats at 1s. per bushel, there is a balance of 10s. per acre in favor of the oats. It must be remembered also that it is not necessary to place on the market all the oats grown. A very large quantity can be used on the farm for feeding purposes. 'Cocky' chaff can be sifted to take out the rough stuff and added to hay in the proportion of one part of cocky chaff to one of hay chaff, sufficient oats being added to give the feed the required quality for working horses. The hay thus saved can be sold at a remunerative price. Then oats can be sown for feeding off purposes. They will give a larger body of feed and last longer than wheat. For this crop on stubble land a light disc implement will be sufficient to stir the land. A bushel of oats per acre will cost 1s. 3d., ½cwt. super. 2s. 6d., and the cost of disking and drilling should be 2s. 6d. = 6s. 3d. If the right class of stock is kept the feed will be worth 6s. 3d. per acre, and probably the value of the next crop will be improved to the extent of 10s. per acre. Some sort of rotation of crops is necessary. In this connection it must be borne in mind that on most farms it is necessary to cultivate large areas for the purpose of getting stubble to burn the shoots. More than three crops of wheat should not be taken in succession from new land. The last crop should be oats. The heavier parts can be cut for hay, and the stubble burnt off that which has been stripped. Then it can be sown with oats again for feeding off, and fallowed the following year; or, if the farmer cannot afford to do this, it is safe to fallow after a crop of oats has been stripped and the stubble burnt. On most farms, however, the sowing of oats to prevent takeall has been neglected. Where stubble land has been fallowed, and there is a suspicion that the lighter soils are likely to develop the disease, no risk should be run, and oats should be sown. One can always rely on getting a good cut of hay from oats sown on well-tilled fallow. The binder will work better in a crop of oats in sand than in wheat on sand. The former grows denser and the roots firm the ground and bind the sand better. The binder can be put to work well up the sides of the steep hills, and the lighter portions of the crop only need be left for the stripper or harvester, as the case may be. Cut as much as possible of the oat crop for hay, because a stack of hay, even if not required for immediate use, is always a good asset on a farm. Past experience proves that every four or five years hay chaff reaches famine prices. Where sheep are kept, and the precaution to sow oats as a preventive of takeall has been neglected, it is a good plan, where a stubble field has to be fallowed, to plough the sandhills and lighter soils early, say in the month of June, sow with oats, and allow the sheep to feed it down close. They will eat all the weeds that are likely to grow after the land has been tilled, and it can be worked early for the following seeding, left until a rain falls, and sown in a damp condition. There are other crops that are immune to the fungus, such as lucerne and peas. The former, however, is too expensive to be tried on a large scale. So far as this district is concerned it is only in the experimental stage. My little experience with peas indicates that they are not going to be a profitable crop on poor sandy soil without a heavy dressing of nitrogenous manure. They will, no doubt, grow profitably on the heavier soils and may do well at the base of sandhills, where there is always an abundance of moisture. It will be wise to continue experiments with these and other fodder plants. Experience indicates that it does not matter how the land is worked, if the takeall is in the field it will develop in the crop, always, of course, bearing in mind that the loose soil seems more favorable to its development. In some districts, in years gone by, farmers ceased fallowing altogether. They found that they could grow more wheat by tilling the grass land. Land so treated did not seem so susceptible to the disease. It is possible that the fungus may be starved out in that way. After the experience of this year, however, there can be no question about the benefit of fallow. There are host plants, on which the fungus may live through the following season, such as barley grass and spear grass, and it is wise to destroy these, if possible, on the fallow field. It is very difficult to destroy all weeds on fallow in this district on account of the retentive nature of the sandy loam. When the disease makes its appearance steps should be taken to wipe it out along the lines indicated. Every farmer must arrange his own plan of campaign. It may be that the disease will be a blessing in disguise, in that it drives the farmer to work his land with the view of growing grass as well as grain. It is well known that the light sandy soil is lacking in humus, and no better means can be devised of supplying that humus than by growing crops of herbage and feeding them off with sheep." Members discussed the subject. The disease was said to be worse in dry seasons than in wet. Mr. E. Colvill said ploughed in shoots and stubble provided a harbor for the fungus, and he advocated burning the stubble, wheat being followed with oats and peas. Mr. Gray recommended leaving the fallow open, to allow the sun to sweeten the land.

COOMANDOOK (Average annual rainfall, 18·01in.).

November 8th.—Present: 15 members.

Harvesters and Strippers.—In a paper dealing with the advantages of the harvester, the Chairman (Mr. Ninnis) said this machine would effectively take off and clean a crop much more cheaply and quicker than a stripper. Time was lost in taking the latter to the heap, emptying the grain and throwing it up. He estimated that the former machine would take a 9bush. crop from 200 acres of land for £9 3s. 4d. less than the stripper. The Hon. Secretary (Mr. C. M. Wilkin) also contributed a paper. He favored the use of the stripper, especially in new mallee country. The draught was lighter, it was better in rough and stony ground, and the cocky chaff was saved. Whilst the harvester could be put into the crop earlier, it was a mistake to bring in and bag up damp grain The majority of members favored the stripper for this locality. It was thought that in anything less than a 9bush. crop it paid better to use the stripper than the harvester.

COONALPYN (Average annual rainfall, 17·49in.).

November 14th.—Present: 10 members and five visitors.

Preparation for Harvest.—Mr. H. Bone read a short paper. All machinery and tools necessary in connection with the hay harvesting, he said, should be in readiness to commence immediately the crop reached the proper stage. As soon as the stacks had settled they should be thatched, or otherwise protected from the rain. Reaping machines, winnowers, &c., should be overhauled and repaired; swings and chains should be inspected, eyebolts fixed; bags looked over and repaired. Bags of corn left in the fields should be stacked off the ground. Earth floors should be cleaned up so that they could be thoroughly dried before they were required for use. White Tuscan was the best variety of wheat for hay in this district. Mr. G. E. Venning advised the following:—White Tuscan, Dart's Imperial, and Clubhead.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

November 8th.—Present: 15 members and two visitors.

Harvester and Stripper.—Mr. A. Schenscher read a paper. He preferred the stripper, as with this machine the draught was lighter, the cocky chaff was saved, and weed seeds were not distributed over the paddocks A better sample of wheat was secured. Mallee stripped with the wheat would dry in the heaps, but when the harvester took up mallee leaves these were shredded and passed into the wheat, with the result that the sample was depreciated.

Mr. C. F. Altmann also read a paper. His experience had been that one 6ft. harvester was equal to two 5ft. strippers. The harvester could frequently be put into the crop two hours earlier than the stripper, and time was lost in taking the latter to and from the wheat heaps. The harvester effected a saving of about £2 10s. per week compared with the stripper. No trouble would be incurred with weevil if storerooms were kept clean and well ventilated. The use of the harvester enabled the farmer to grow the tougher threshing wheats, which would not shake out in the event of winds during harvest. These could only be gathered with the stripper in the middle of the day, but the harvester would take them off without trouble. The wheat could be moved from the paddocks immediately where the harvester was used. If the machine were handled properly weed seeds would not be blown over the land, they would be gathered in the screening box. Straw was better than cocky chaff for young stock.

WILKAWATT (Average annual rainfall, 16in. to 17in.).

November 8th.—Present: 18 members and seven visitors.

Wheat Floors.—Mr. F. W. Altus read a short paper. He advised the selection of a small hard rise, from which the stumps should be cut level with the ground during the winter. Five or six horses should be driven around this until it was well beaten. At the time hay-making was in progress the floor should be gone over with the mower, cutting as close as possible. Some members advised selecting a site for a floor, and retaining this uncropped.

CULTIVATION OF MALLEE LAND.—A paper on this subject was contributed by Mr C. Sorrel. He mentioned that crops on fallow land in this district at present were not a success. He recommended the following procedure :—After taking off the crop, the stubble should be fire-raked, and the land left out for two years for grazing. During the second winter or spring the shoots should be logged, and the springbacks and young shoots cut in February. This should be fire-raked and the land ploughed immediately to a depth of 3in. if the soil were firm, and 2in. if it were sandy. If rain should fall and weeds germinate, the land should be cultivated before being drilled, the harrows following the latter operation. In the absence of rain after ploughing, the roller and harrows could be put over the firm ground before drilling ; it would then be unnecessary to harrow after the drill. Crops on land treated in this manner would not be so liable to takeall. One member had tried the method recommended in the paper, but the crop was as badly affected with takeall as those sown on stubble land.

WILKAWATT.—HOMESTEAD MEETING.—The meeting was held at the homestead of Messrs. Bowman Bros. It was noticed that most of the stubble paddocks were badly infested with takeall. A crop on fallow looked very well, and was estimated to yield about 15bush. per acre. Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S. (Superintendent of Agriculture in the South-East), delivered an address. He did not favor the practice of ploughing back fallow, but recommended rolling light land after ploughing. Fallow should not be worked more than was absolutely necessary. Seed should be carefully graded and heavier dressings of manure applied.

ANNUAL REPORT.—The Hon. Secretary read the annual report, which showed that the Branch was in a flourishing condition.

MORGAN, November 8th.—PIG-RAISING.—A discussion took place on the paper on this subject read by Mr. O. Hausler at the last meeting, and printed on page 551 of the November issue. Mr. H. Wohling preferred the Berkshire. The Chairman thought a great deal depended upon the manner in which pigs were treated and fed. Members generally agreed with the ideas expressed by the writer of the paper.

WYNARKA, October 31st.—HOMESTEAD MEETING.—The meeting was held at the homestead of Mr. G. G. Pitt. Members inspected the crops. It was noticed that those on ploughed land looked far better than crops sown on cultivated land. Mr. Pitt gave some practical hints on blacksmithing which were much appreciated, as Mr. Pitt thoroughly understood the trade.

SOUTH AND HILLS DISTRICT.

FOREST RANGE (Average annual rainfall, 35in. to 36in.).

November 13th.—Present: Eight members and one visitor.

POTATO-GROWING.—Mr. Dollman reported that he had secured best results from potatoes planted on old ground. Mr. McLaren said the rows for this crop should be 2ft. apart, with the sets 14in. apart. Snowflakes should not be given too much room or they would grow coarse. He used bonedust with the crop, putting it direct on to the seed. The results of potash did not justify its use in this district. He made a practice of planting new ground, working it well before putting in the crop, which was best done during the first week in September. Each set should have at least one good eye. Snowflakes had been the best yielding crop with him. Mr. F. Green also thought it advisable to plant Snowflakes close together, and he preferred putting them on new ground. Mr. H. Green thought well-worked old land equal to new. He put the manure in the furrow with the seed. Mr. Schultz's experience was that better results were secured by giving the seed plenty of room. The general opinion of members was that early crops should be planted in October and the late varieties in December, so that they would benefit from the autumn rains.

INMAN VALLEY (Average annual rainfall, 26in. to 27in.).

October 8th.—Present: 12 members and two visitors.

FARM MANAGEMENT.—Mr. H. J. Meyer read a paper as follows :—" It is impossible to lay down any hard and fast rules as to farm management, for one has to take into consideration the varied climatic and soil conditions, and therefore it can be quite readily understood that what might be suitable for one part of the State would be quite the reverse in another. I know of no district in which mixed farming can be carried on so admirably as in this. We have an assured rainfall, and therefore if in my paper to-night it should seem that I have not paid very much attention to the actual growing of grain I am sure members will readily understand the reason. To successfully manage a farm from small beginnings and little cash at starting is not as easy as a number of people may imagine. They see in places fine farm homesteads, with good fences, up-to-date implements, well-bred stock, &c., and then imagine what a fine time the farmer has. They very often lose sight of the fact that it has perhaps taken years and years of hard work, thrift, practical experience, careful breeding and culling of stock of all kinds to bring the farm to its present satisfactory condition. If the man has to depend mainly on his own efforts it will be well for him to go slowly for a few years. A small holding well managed is better than a large area badly managed, and a small number of good stock well cared for is better than a large number of inferior animals. It is a very near-sighted policy to overstock. The necessity for carefully planning out the work of the farm from time to time is of vital importance, as by so doing time will not be lost in the event of the weather proving unsuitable for certain operations. Care should be taken that when the busy time is at hand no delay should occur in getting implements, harness, &c., ready. All this should be done some time before. The working horses are a very considerable asset to the farmer. It is of the utmost importance that they should have the greatest attention and care as to feeding, not only during the working days, but it should be seen that the team is in good condition before that time arrives, and also that the harness is well oiled, and that the collars fit; otherwise it is impossible to get the most out of the team. Every farmer should breed his own foals. I find in a district like this, where the work is not so continuous, that the mares will do all that is required of them, and breed a foal also. The stallion which we consider the best travelling the district has far too many mares, and therefore the results as a rule are very disappointing. The only way that I can see to overcome this difficulty is for a number of farmers in the district to club together and buy a stallion. A first-class horse could be procured which, on account of the big price, one individual would be unable to purchase. By this means the farm horses would be very much improved. I am of the opinion that it pays to have the very best stock that one can afford, whether it be horses, cattle, or sheep, for land values are far too high to allow one to keep inferior stock. There is a difference of opinion as to the class of horse most suitable for the district, but I prefer the Clydesdales, for the reason that they are active, strong, good workers, and have the advantage of being very docile. I have tried the lighter sorts, but found, though willing, that too great a strain was put upon them in the hilly and heavy lands of the Bald Hills; hence they suffered in condition. All the young stock on the farm should have very careful attention, and should on no account be allowed to get low in condition, especially in the yearling stage. Therefore it is advisable during the cold weather especially to feed them on hay at least once a day. If the pastures are good they will thrive. Otherwise, if allowed to become low in condition, their digestion becomes impaired, their constitution weakened, and consequently their future usefulness is very much curtailed. These remarks hold good even to a greater extent if possible in the future dairy cow. It is not within the province of this paper to advise which is the best breed of sheep to keep. Each man having regard to the size and locality of his farm must decide for himself, and then having decided stick to that breed and keep the best of its kind. Due regard should be paid to the property itself, keeping fences in order and generally improving the appearance of the homestead. There is no truer axiom than that 'bad fences make bad neighbors.' Every farm should be made sheep-proof and subdivided into fairly small paddocks, as the stock like a change of pasture occasionally. I strongly advocate running a few head of young cattle in every sheep paddock, as they will eat up the rough tufty grass which the sheep will not touch, thereby sweetening the pastures for the latter. Sheep thrive very much better on short feed. No farm in a district like Inman Valley is properly equipped without a dairy. The number of cows to be kept must be determined by the number in the family, because I do not think that it pays to hire labor for the dairy. Each cow should be tested as to her qualifications, so that one sees that the cow keeps the farm and not the farm the cow. At present prices nothing is returning more profit than pigs. Poultry well managed is another valuable asset to the farm; but to keep fowls of all colors of the rainbow, fed on screenings, allowed to roost on machinery of all kinds, in trees, and wood heaps is to court disaster. It should be the aim of the farmer to keep the breed of fowls which will lay well when eggs are a good price. Almost any fowl will lay when eggs are 6d. a dozen. It is a prudent man who looks upon the by-products as a great source of income, for one has to take into account the seasons varying and prices fluctuating. There is always some particular line selling well, therefore it is wise not to have all one's eggs in one basket. This district is certainly not an agricultural one, but every man should at least grow enough hay to tide his stock over the wet, cold months of the winter and early spring. Algerian oats give better returns than wheat, as they are not nearly so likely to feel the effects of the wet seasons. Whatever cereal is grown too much attention cannot be paid to the choice of seed. No well-conducted farm should be without a blacksmith's forge. It fills in wet days, and it is astonishing how handy the ordinary man can become in making bolts, S hooks, &c. It not only saves a great deal of time in running to the blacksmith, but it is a money saver also, for I take it that a farm to be successfully managed must be as self-contained as possible. The home should be well supplied with fruit and vegetables of the farmer's own growing. They are healthful and help to curtail expenses. No difficulty should be experienced in growing them all the year round in a climate such as ours. My paper would not be complete if I were not to impress on members the importance of having all implements, &c., well protected from the weather, and all haystacks well thatched, or, better still, covered with iron." In reply to a question Mr. Meyer said he preferred the Babcock tester for testing dairy cows. He considered that four good cows would return sufficient to meet the household expenses of a family of five.

IRONBANK (Average annual rainfall, 33in. to 34in.).

November 14th.—Present: seven members and one visitor.

Cleaning Strawberry Ground.—Mr. C. Morgan dealt with this subject in a paper. To clean old strawberry ground, he said, the best method was to break or plough over the ground to a depth of about 4in. as soon as the crop had finished. It should remain rough, and at the end of a month or six weeks should be scarified, which operation should be repeated every fortnight or three weeks during the summer. During May or early June field peas, at the rate of 2bush. or 3bush. per acre, should be ploughed in, together with 3cwts. or 4cwts. of bonedust. After the pea crop was taken off the ground should be ploughed to a depth of about 6in. and left rough. After a month or six weeks it should be scarified, this operation being again carried out monthly through the summer Prior to replanting the ground should be well ploughed and harrowed, about 10cwts. or 12cwts. of bonedust per acre being ploughed or dug in. The plants should be put 10in. or 12in. apart in rows 24in. apart. The roots could be put well down with the aid of an old trowel. Sorrel should be destroyed immediately it appeared. Strawberries would not do well with pear or cherry trees.

Rearing Calves.—Mr. Reuben Coats also read a short paper, in which he said young calves should be fed twice daily at regular hours. They should be kept clean and comfortable, extremes of heat and cold being avoided. A light chain with a free-running swivel should be attached to a strap loosely encircling the neck of the animal. On no account should it be tied near a fence, as there was a danger of its learning the habit of crawling through, which practice would cause considerable trouble in after years.

KANMANTOO (Average annual rainfall, 17·90in.).

November 6th.—Present: 14 members and one visitor.

Sheep-Dipping.—Mr. H. G. Pym read a paper on this subject. Sheep which were infested with tick and lice, he said, would not do well. The staple of the wool was often broken, and it became discolored and lustreless. The dip should be kept up to the full strength and free from mud, &c. It was advisable that dipping should be made compulsory, otherwise sheepowners would never be rid of the trouble. Some contended that it was best to dip the flock off the shears, as after shearing the tick quickly left the sheep and took refuge under cover afforded by the pasture, returning to the sheep again after the wool had grown. A suggestion had been made that the law should be amended to provide a penalty for neglect to dip infected sheep after shearing. Some members favored this proposal, whilst others thought compulsory dipping more likely to be effective.

MENINGIE (Average annual rainfall, 18·87in.).

November 15th.—Present: 14 members and one visitor

Sheaoaks.—Mr. W. H. Mincham read a paper. Whilst gums and pines grew fairly well in this district, he said, the sheaoak was the tree most suited to the climatic conditions. This reached maturity in about six or seven years. The timber could be used for fencing in water or pipeclay flats, but it would not stand in dry soil. It also made good firewood. He advised landholders to fence off an area of sandy or hilly land and plant it with these trees. The "apples" should be gathered when hard and left in a box or tin in a dry place for a few weeks. The seed could then be broadcast or sown in rows on the land, which should have been already ploughed, and covered to protect them from the birds. Rabbits were also very destructive to the young trees. If put in with the first rains the trees would stand through the summer. They sent down a deep taproot, and throve well if they received a good start. In dry seasons the foliage could be cut for stock feed. After being clipped the trees sent out a supply of fresh tender leaves. These trees should be more profitable than wattles. They should not be planted too close to orchards, as the rough bark provided a harbor for insects, and small birds congregated in the trees. Mr. Wright mentioned that as stock readily ate the female oak, but not the male, it was advisable to cut leaves for fodder only from those bearing "apples." Mr. Hiscock recommended broadcasting the seed on ploughed land and turning on sheep to tread it in. If the seedlings were to be transplanted they should be removed as soon as the first shoot appeared, otherwise the taproot would develop to such an extent that this would be difficult.

MORPHETT VALE (Average annual rainfall, 23·32in.).

November 18th.—Present: 13 members and two visitors.

Zealand Blue Wheat.—A sample of this variety of wheat in the hay stage was tabled by Mr. O'Sullivan. It was of splendid growth, 3ft. 6in. in height, but was too late to sow with oats for hay.

Hay Crops.—Mr. F. Crittenden read a paper. After five years' experience, he said, he believed it would pay to purchase an improved farm of 500 acres at £12 per acre, if an average crop of two and a half tons of hay per acre could be secured; interest at the rate of 5 per cent. per annum on capital being allowed, and all labor paid for. Two hundred acres could be cropped each year. The land should be fallowed in July or August, and worked as frequently as possible, excepting in dry, hot weather. Carefully selected seed wheat should be sown, and heavy dressings of manure were advisable. The harvesting should be well distributed. King's Early was a good early variety, but required thick sowing, *i.e*, 2bush. per acre. White Tuscan was the best wheat, either sown by itself or with oats. It kept its color, and handled well in hot weather. Two hundredweights of manure per acre was not too much for hay crops. Members generally did not favor growing early wheats on fallow. If dressings of 2cwts. of manure were applied to land that had not been fallowed and worked well, there was a danger of the crop blighting off in a dry season.

BLACKWOOD, November 10th.—**Pruning.**—Mr. Geo. Quinn (Horticultural Instructor) gave a spring pruning demonstration in the afternoon and a lantern lecture on the formation of the fruit tree in the evening.

MacGILLIVRAY, November 11th.—**Sheep-Dipping.**—An article from an agricultural publication was read by Mr. R. Wheadon. Members agreed that it was advisable to dip sheep, and it was noted that by using a powder in the dip instead of a liquid preparation there was less likelihood of the effect being lost in the event of rain falling on the sheep after they were dipped.

SOUTH-EAST DISTRICT.

MOUNT GAMBIER (Average annual rainfall, 32in.)

November 8th.—Present: 14 members.

Spraying Fruit Trees.—Mr. R. Fowler, Inspector under the Fruit and Vegetable Acts in the lower South-East, read the following paper:—"Spraying with arsenate of lead for codlin moth, and fumigation with hydrocyanic acid gas for red scale of the orange and lemon, have been made compulsory, and it is the duty of anyone owning fruit trees to have those trees properly attended to for the prevention of codlin moth and other diseases. It is necessary first of all to know something about not only the spray to be used, but the insect or disease to be combated, and the manner in which the spray acts upon it. Insect and fungus pests can be divided into two classes, requiring different methods of treatment. The two classes of insects are—those which chew their food with their mandibles or jaws, such as beetles and the larvæ of moths, and those which seek their food through their suckers (*haustellata*), such as the aphides and scales. The easiest way to attack the chewing insects is by poisoning their food. For this purpose there is nothing better than arsenate of lead. This preparation has been in use some years now, and has proved a remedy for codlin moth in Australia, America, and elsewhere.

The larva of the codlin moth eats its way into the apple, so that if the apple is coated with an arsenical poison at the time the grub attacks it, the young grub must be poisoned. The success of the spraying for this pest depends on whether the fruit has been properly covered with spray. If the grub once gains an entrance into the fruit no spray can reach it. The codlin larvæ do not long remain on the outside of the fruit, therefore it would be hard to kill it with a contact spray. That explains why kerosene emulsion is not a success against codlin moth. The first spraying is the most essential, and this should be applied just after the blossom petals have fallen, within three or four days. The calyx of the apple and pear is then open, but this, in some varieties particularly, soon closes up, and if the poison has not been placed there previously the larvæ of the codlin moth is given a safe entrance. This is the part of the fruit most liable to attack from the first brood of codlin. As the young fruits at this time grow rapidly it necessarily follows that portions of the fruit soon become exposed, so that it is important to renew the spraying at fairly short intervals—a fortnight or three weeks separating the first and second spraying, and three weeks or a month the second and third; and with late varieties of apples it is well to apply even a fourth spraying. The bandage trap should also be put around the trees this month, and examined every seven or nine days for the purpose of killing any grubs hiding there. This should be done till all the apples and pears are gathered, and even once or twice during the winter months, to catch any grubs that may be driven by the cold and wet from their former shelter. The second class of insects secure their food by suction. They do not eat the plant tissues or fruit, but by thrusting their proboscis or rostrum through the outer tissue of the bark, leaf, or fruit, suck the juices. They are usually very sluggish, and generally remain stationary unless violently removed. They cluster thickly upon stems, leaves, and fruit, and can be directly reached with a spray, which will kill them by causing suffocation or internal irritation. This action of the spray will be better understood when it is remembered that insects have no lungs. Their respiratory system is of the simplest description. An insect breathes not through the mouth, but through a number of minute openings on the two body segments. These openings connect with the vital organs, and, if clogged with some contact spray, suffocation will result. Most contact sprays kill in this manner, although perhaps a certain amount of internal irritation is also set up. It will be seen, then, that for sucking insects, such as peach aphis, woolly aphis, red spider, and any of the scale family, a contact spray is the only remedy. Arsenate of lead would be useless. Some of these insects are coated with a sticky resinous compound, some with a downy covering like wool, and some with a waxy shield, all of which coverings are impervious to water. A spray of a very penetrating nature, driven with sufficient force to break up or dissolve this outer covering, to get the insect beneath, is therefore necessary. Contact sprays mostly used in the orchard are kerosene emulsion, tobacco wash, and red spraying oil, the latter preparation being much used during the winter, its action on the young leaves making it unsafe to use when any foliage is on the trees When spraying with red oil it is necessary to be very careful in preparing the mixture, or injury may result. See that all the vessels are perfectly clean, and with all spray mixtures use only rain water. Any trace of lime will break up an oil emulsion, and will cause arsenate of lead to precipitate very quickly. If no rain water is available, a hard water may be softened by the addition of a little washing soda. The fungus diseases are of two classes. First there are those which grow upon the surface of the trees and absorb their food from the superficial cells of the host plant by means of suckers, examples of which are the mildews, of which the oidium on the vine is typical. They are termed epiphytic external, because the fungus threads grow on the outside of the leaves, and may be destroyed by dusting flowers of sulphur upon them during hot weather, or by spraying with either Bordeaux or Burgundy mixture. Then we have the endophytic internal fungus, that which grows inside the plants and leaves, and cannot be reached by any spray. These are best represented by black spot of the apple and pear, curl leaf of the peach, shothole and scab of the apricot, and also Irish blight in potatoes. It is obvious that to kill these fungi when visible, the leaves and fruits must necessarily be destroyed, so that spraying for this class of fungus can only be regarded as a preventive, and to be at all effective should be applied when the spores of the disease are germinating on the outside of the plants, as the spray will prevent the spores when disseminated over the plants from germinating and starting fresh outbreaks of disease. The proper time to spray for black spot on apple or pear, shothole, and scab is just when the blossom buds are bursting, and at a slightly later period. Two sprayings are usually given for these diseases, but for curl leaf, once this disease appears in the leaves it is useless to spray: the fungus is inside and canot be reached. If only a few

are usually given for these diseases, but for curl leaf, once this disease appears in the leaves it is useless to spray: the fungus is inside and cannot be reached. If only a few

leaves are affected they may be pulled off and burnt. A few points to remember about spraying are:—Have a good outfit; one that will give sufficient power to do the work properly, and keep the mixtures well agitated. See that all vessels used are perfectly clean. It is not advisable to mix sprays, though sometimes this is done, arsenate of lead being added to Bordeaux to make a combined insecticide fungicide. Spray on time, with the right material, and of the right strength. See that every portion of the tree has received a thorough dressing, remembering that it is the fruit and the calyx of the fruit that requires attention, and as the fruit grows with the calyx standing upward and outward, it follows that the spray is better applied from above than from below. A tree at the first spraying for codlin moth should be thoroughly soaked from top to bottom, so that every calyx on it is filled. The spray nozzle should give a fair driving spray, not a sort of shower bath. Spray with the wind as much as possible, it helps to drive the spray. Second and subsequent sprays may be applied more as a mist, as the idea is to leave the poison on the fruit, not wash it off by a too heavy application. By carefully following these methods it is possible to save 95 per cent. or more of fruit from the codlin grubs, and it is to the advantage of everyone with fruit trees to carefully attend to the spraying for the numerous pests that now attack them. With trees like those at Mount Gambier it may hardly be possible to get as good results as in some places, because they are so high and hard to get at, but 80 per cent. to 90 per cent. of clean fruit should be easily obtained." In reply to questions Mr. Fowler said it had been estimated that it would take the poison off 895 apples to be dangerous to man. He had heard of trees being heavily sprayed, and the grass underneath fed to cattle and sheep without injuring them. For curl leaf on peaches the Bordeaux mixture should be used. The spray should be applied when the trees were coming in blossom, and if bad, again next day. For shothole in apricots they could not spray too often. Spray before the blossom came, and then soon after. When trees were badly affected shothole was hard to get rid of. Most of the pumps used had agitators, but with the smaller ones it was necessary to stir the mixture frequently. The codlin grub took about three weeks to mature, and would then get into the bandages, where it would remain for eight or nine days, or perhaps a shorter period. Then it would, as a moth, go on with the laying of eggs, and there would be two or three broods in a year. He had found grubs as late as December 26th. He had used, at Coonawarra, a mixture known as Fremer. The preparation was diluted and hung up in vessels in the trees. It had a sweet odor, and was said to attract codlin moths. In five bottles at Coonawarra he had taken 20 moths, but had not had sufficient experience with it as yet. The Government Entymologist in Victoria (Mr. French) spoke highly of the mixture.

Mouth Disease in Sheep.—Mr. D. A. Collins reported that the lips of some of his weaners had become thick, the animals could not feed, and lost condition. In some cases their mouths became quite raw through being rubbed against posts and stones. A mixture of one part Little's sheep dip with 25 parts water, sprinkled on the affected parts from a bottle with a V-shaped aperture in the cork had effected a complete cure within 10 days. In bad cases he had dipped the head of the sheep into the mixture.

NARACOORTE (Average annual rainfall, 22·60in.).

October 11th.—Present: 15 members.

Horses.—Mr. W. J. Colebatch, B.Sc., Agric., M.R.C.V.S. (Superintendent of Agriculture in the South-East), delivered an address. Serious injury or disease in farm stock, he said, demanded just as much care and skill on the part of the practitioner as in human beings, and a fully trained and equipped veterinary surgeon able to devote his whole time to the district was urgently needed. The lecturer then gave some of the leading points which constituted a good sound horse. The cornea of the eye should be free from opacities, and the pupil clear and transparent. If they found a horse with one of the eyes small they might conclude that it was subject to recurrent ophthalmia. They should also notice the alertness of the eye and the hearing, and also examine the ears for small cancerous growths. They should look beneath the jawbone to see if there was an open wound due to a rupture of the satirary gland duct. This was a troublesome injury, and horses so affected were rarely good buying. He would not place too much stress on the lampas. He did not believe in burning them out. They should look down the neck for any lumps and examine the jugular vein. A good deal of bleeding was still done in parts of England, but in modern veterinary practice it was hardly ever resorted to. Sore shoulders were sometimes caused by a fungus. Big tumors, broad based, with pus issuing from depressions all over their surfaces, would sometimes be found on the shoulders. They usually required surgical treatment, but when widely spread it was often wise to resort to counter-irritants first. The effect of blistering them was to contract them, and then they were more easily excised. He advised particular attention to the forearms, as their development indicated the natural shape and symmetry. The points in the leg to which particular attention should be paid, then came under review, and the ailments of the cannon bone were explained. Well placed splints were no detriment to a horse. Three kinds of splints had to be looked for. First, the knee splint, which was placed so close to the joint that extension and flexion resulted in painful pressure and lameness. Second, the posterior splint, situated at the back of the cannon bone and interfering with the free play of the suspensory ligament and flexor tendons at the back of the leg. Third, the bridge splints, which resulted from the development of a ridge of bone across the posterior face of the cannon bone from one splint to another. Splints were the result of hereditary disease, but were not regarded as serious hereditary defects except so far as their presence in large numbers was indicative of a soft spongy type of horse. He also counselled an examination of the back of the forelegs. Flat bone, he stated, was a misnomer. He explained the anatomy of the foot or hoof. Ringbone was a development of bone round the coronet joint, and should be examined closely. He would not buy a horse with greasy heels, because there was no certain cure for it. They should see that the frog was good, and wide heels were necessary for a good strong horse. The bars on the foot should never be touched. There was a danger of foundering caused by overfeeding. Fistulous withers, poll evil, and quittor were touched upon, and he further explained that in the case of grey or white horses an inspection under the dock for malignant tumors should always be made. The stifle required examination. The various forms of the disease of spavin were explained. In connection with the dropping of foals there were a good many losses which could be avoided by a little prompt attention. They required to get the foals under treatment at once. Bleeding of the navel was one of the troubles of young foals that required attention, and it might occur under the most favorable conditions of birth. Sometimes it was the result of the cord being snapped off. He advocated washing it with an antispetic, first of all tying it round with a piece of tape about an inch wide. This should be taken off after 24 hours. They could either apply to the wet part perchloride of iron, which would cause a clotting of the blood, or grip the skin around the navel with a clamp and sear it. Another ailment which sometimes led to serious trouble was the running of urine from the navel. As there was no immediate danger they could leave it for a fortnight, and if the flow had not stopped they would have to take action. The first thing they would have to do was to see that the natural passage for the urine was opened. They should wash the affected part, put a ligature on it, and leave it for a week. If it then did not heal up they could apply a blister, which would cause a swelling and then grip it with a pair of clamps. Under normal conditions the navel should dry up and the cord drop off, but when it kept in a moist condition it gathered dirt and germs, and he believed that this was the cause of the death of several foals in the district last year. It was necessary to use internal antiseptics such as formalin. They should also carefully watch the bowels of foals after birth, for often certain material accumulated in the intestines before birth which required to be moved. For this they could use a lukewarm water injection and allow it to soak for half an hour. They could also use soap or oil and pass it in with an enema, with an opening drench of castor oil and laudanum. A number of questions were asked and replied to.

Wheat Crop and Virgin Land, Pinnaroo.

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T. PASCOE,

Minister of Agriculture

POINTS FOR PRODUCERS.

Farmers' Conference.

The Annual Conference of Northern Branches of the Agricultural Bureau is to be held at Gladstone on Thursday, February 19th, 1914. The opening ceremony will be performed by the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), and addresses will be given by the undermentioned officers of the department:—The Director of Agriculture (Mr. Wm. Lowrie, M.A., B.Sc.), the Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), and the Dairy Expert (Mr. P. H. Suter). Papers will be read by members of branches situated in the Northern districts. General arrangements are in the hands of the Gladstone Bureau, and, as usual, the proceedings will be open to the public.

New South Wales Harvest.

The wheat harvest of New South Wales for the present season is estimated by the Government Statistician at 41,800,430bush., or 8,313,094bush. more than the actual yield last year. The acreage to be reaped for wheat is given as 3,136,071 acres, or 905,157 more than last season.

Argentine Wheat.

In his report for 1912 the Minister for Agriculture of the Argentine remarks that the diversity of the quality of Argentine wheat is notorious. This variation arises not only from its being grown in regions in which the climatic conditions are so different, but from degeneration and the process of adaptation which it has undergone. With the object of overcoming the disadvantages at which Argentine wheat is thus placed in foreign markets, the Ministry of Agriculture has commenced the work of selecting seed, and has engaged an English expert for the purpose. The experimental cultivation of wheat will be carried on at Pergamino for the first year and afterwards will be extended to the principal wheat-growing districts of the Republic in order to produce sufficient stocks of the selected variety.

Scheme for the Improvement of Livestock.

The British Board of Agriculture and Fisheries have had placed at their disposal a sum of £37,000 by way of grant in aid of the improvement of livestock in England and Wales for the current financial year. The main object of the scheme, says the *Journal of the Board of Agriculture*, is to afford means of demonstrating to groups of farmers, especially the smaller farmers, that it is sound economy and of pecuniary advantage to use only sound and high-class sires, and to keep records of the milk yield of their dairy cows, with a view to getting rid of poor milkers and improving, by judicious selection and breeding, the productiveness of their herds. The assistance will take the form of financial help, preferably to farmers' clubs or societies, for the provision of high-class bulls, stallions, and boars at the same low fees as are usually paid for the use of an inferior type of sire; and the Board are also authorised to pay one-half of the expenses of associations of farmers formed for the purpose of taking and checking the milking records of the herds of their members, but such grant is not to exceed £50 to each association.

Animal Foods and Egg Production.

The 1912 report of the Ontario Agricultural College contains particulars of an experiment to ascertain the effect of feeding Buff Orpington, Rhode Island Red, and Leghorn hens and pullets on various kinds of animal food. It was found that buttermilk produced the most and the cheapest eggs. In all cases birds which received no animal food produced the smallest number of eggs, but these eggs had the greatest hatching power. The Leghorns supplied with the ration containing no animal food developed the habit of feather eating to a great extent, and of the three breeds they appeared to be most in need of this class of food.

The Value of the Pig.

"I know of no more powerful agent in transforming poor land into rich," states a writer in the *Agricultural Gazette*, "than the domestic pig. Give a man a few acres of poor land (not bad, but poor) and plenty of pigs, and I venture to say that there will be a more or less sudden conversion. The pig is in itself profitable, but the manure it leaves behind is of even greater value to the feeder than its increase in weight. Pigs are the best kind of stock for a man who has a small tract of poor land, and there seems to be no limit to the improvement which may be effected by and through their presence."

Breeding from Sound Sires.

Some interesting particulars are given in the September issue of the *Journal of the Board of Agriculture* (Eng.) of the Castle Eden and District Cart Horse Society. The society, which has been in existence for over 50 years, was established with the object of giving farmers in the Castle Eden District the opportunity of breeding from sound sires on reasonable terms. A deputation of members visits stallion studs and selects two horses each year for the purposes of the society. The horses must be passed as sound by a qualified veterinary surgeon, and proof must be given that they are safe stock-getters. The owner is required to enter into a written agreement with the secretary of the society promising to carry out its rules and conditions under a penalty of £60. He receives from the society a premium of £60 for each horse, and, besides this, he is paid by the owners of the mares £1 for each mare served at the end of the season and £2 when a mare proves to be in foal. The owner of the mare also pays the groom's fee. Non-subscribers using the horses pay 10s. extra for each mare. The season commences in March and ends in July, and the horses are not to serve more than 90 mares each. During each of the last five years the society has secured the services of two horses, pure Clydesdales, of a market value varying between £200 and £350. The approximate number of mares served has been 176 per season, that is 88 per horse. It is estimated that the number of foals has averaged from 50 to 60 per cent. of the number of mares covered, which would give an average of 88 foals per annum. At this rate the horseowner received on the average in premiums £120, in service fees £176, in foal money £176, total £472, or an average of £236 per horse. The expenses of the society averaged for the last five years £144, and the income (including subscriptions, £99, and an annual grant of £25 from the county agricultural society) £124, thus showing a loss each year of £20.

Agricultural Returns for England and Wales.

The preliminary agricultural returns for England and Wales collected in June last have recently been published. Compared with the figures for 1912 they show a decrease in the total area under crops and grass of 45,308 acres. The area under wheat was less by 162,000 acres; oats also decreased by 98,000 acres, but the area under barley increased by 102,000 acres. Most of the other crops show a decline, probably owing to the difficulties of the sowing season. Potatoes declined by 21,000, mangolds by 66,000, and clover and grasses by 27,000 acres; but the area reserved for hay, whether seeds or meadow, increased by 273,730 acres. The livestock returns show decreases among all classes of animals. The decline in horses is slight, but the total number of cattle, 5,716,944, is less by 124,776. Sheep have declined by over 900,000, and pigs by over 390,000.

Method in Grazing.

Recklessness in grazing operations will never pay if the pastures that are being grazed are worth the average rent. Cattle, horses, and sheep grazing together make a pretty picture in either water-colors or oils, but allow all these to run slipshod over a piece of rich pasture which has just thrown up a good thick bottom of spring grass, and a very large portion of the feed is trodden down and spoiled, and that in far less time than it would have taken for all these animals to have grazed the piece, having sufficient all the time if the correct method had been put into practice. We have long been convinced that it is essential to our progress and profit as farmers to bring system and method to bear in feeding our root crops, and it is hardly necessary for me to mention here the work that would accrue were cattle and sheep permitted the liberty of a piece of swedes with which to dispose as suited to their immediate conveniences.—*Agricultural Gazette.*

Common Salt as a Fertiliser.

In agriculture salt is often used as a manure. It starts chemical changes which set plant food free, and it attracts moisture, but its use requires care. When strong it poisons plants and it is often used on garden paths for killing weeds. Even when employed as a fertiliser it often acts as a check on vegetation at first. It has been remarked that the general effect of salt on kitchen garden vegetables is to increase the thickness and size of the leaves, and it has been proposed to use it systematically in the case of those vegetables, such as cabbages, where the leaves are eaten. European experiments, Rothamsted amongst others, have shown that quite a remarkable quantity of chloride of sodium is carried far inland and comes on the land with the rain.—*Mark Lane Express.*

A Suburban Road.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c.. diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

A member of the Yadnarie A. B. inquires the cause of a horse's foot swelling, the swelling subsequently extending to the head and body.

Reply—The symptoms are altogether too indefinite to venture an opinion on. The main causes of such swellings are—Blood-poisoning, arising from an injury or snakebite ; invasion of the system by germs, generally called influenza or lymphangitis ; and the most common of all swellings arising from interference with the circulation caused by the development of blood and stomach worms. Recovery often occurs without treatment, or if this is given it may be simply saline laxatives, such as an ounce or two of Epsom salts or hyposulphite of soda once or twice daily till the swelling subsides.

" Mikkera," Port Lincoln, has a cow which has large teats, but which is exceedingly hard to milk. He asks for advice.

Reply—Probably it would be best to fatten and sell the cow ; otherwise draw the milk with a teat syphon, but be careful to boil the syphon each time before and after use.

" W. S." has some horses which at times blow so as to prevent their being worked. They are fed on oaten chaff.

Reply—The diet is wanting in certain constituents. Feed a little crushed wheat or wheaten chaff with the oaten and, if possible, molasses or oil cake.

" E. T. C.," Parilla, requires treatment for a pony which is suffering from a slipped shoulder of four months' standing.

Reply—If possible give a swim daily in a dam and well hand-rub the shoulder for quarter of an hour afterwards, or well rub in a blister made of red iodide of mercury 1 dram, lard 7 drams ; keep the pony tied up for 24 hours after so that it cannot bite the blister.

"X. Y. Z." has a cow which calved seven weeks ago. She is in good condition, but gives milk which has a sediment of blood. There is nothing visibly wrong with udder or teats.

Reply—This trouble is common, and in a case like this is probably due to a slight congestion of the secreting membrane of the udder, and will gradually get right; but 10 drops of tincture of arnica given morning and evening in a mouthful of bran or pollard will hasten the recovery.

"J. F. W.," Macclesfield, asks—(1) Is there any method of destroying mice in haystacks? (2) How to destroy lice on pigs?

Reply—(1) There is probably no practical way of getting rid of the pests. Poisoning with advertised preparation such as Battle's vermin killer baited about the stack may reduce them, but care must be taken in regard to other animals. Ferreting the stack will help to disturb them, and cats are useful. Tarred boards around the stack will help to keep them out. (2) Spray the pigs with Cooper's sheep dip, or lysol, or cyllin; the dip prepared as on packet. Use 3ozs. of the disinfectants to the gallon of water, preferably soapy. Then oil them with any cheap oil, such as train oil, to each gallon of which add 4ozs. of sulphur. Three applications at intervals of a week should free the pigs; but they must be watched afterwards, as any lice that have escaped will be breeding in a fortnight again. Take precautions that the poisonous dip does not drain into stuff the pigs or fowls can get at. The pigs' houses will also want spraying with disinfectants and limewashing.

"J. P. H.," Waukaringa, states that a number of horses in the north-east district have become blind through eating paddy melons. He asks—Can you recommend any cure?

Reply—Blindness following the eating of paddy melons is very common, and prevention is better than cure—keep the horses off them. As treatment, a brisk purgative is advisable—5 to 8 drams of aloes given as a ball after preparing the horses by giving bran mashes only for two days. Bleeding, 1 to 2 quarts at the neck or arm vein is also recommended. Local applications to the eyes are not much good, but cooling lotions such as methylated spirit and water, half and half, may be used. An ounce of sulphur daily in the feed is sometimes of use in preventing the blindness.

"J. P. H." writes in regard to the effect on stock of paddy and pie melons.

Reply—There is very little doubt that the constituents of pie melon are more digestible than paddy, but the balling in the stomachs of ruminants is a nuisance; it can, however, be mitigated to some extent by feeding roughage, such as cocky chaff, with it. Indeed, in some countries it is practically the only feed available. The paddy (*Cucumis myriocarpus*) and the pie (*Citrullus vulgaris*) undoubtedly cross, and the poisonous constituents of the former are lessened thereby, but the hairy nature of the latter produces the trouble referred to. Both bring on diarrhœa and stomach irritation followed often by obstinate constipation and blindness, due to substances like elaterine and colocynth.

" J. E. W." asks for a definition of the terms " piebald " and " skewbald."

Reply—Technically a piebald is a black horse with large splashes of white, or *vice versa*, and a skewbald is a horse of any other color with splashes of white ; but popularly both are often termed piebald, incorrectly, however, as the name originates from the black and white of the magpie. Books on the subject—" Book of the Horse " (Axe) ; " Horses and Stables " (Fitzwygram) ; " Horses : Breeding to Color " (Gilby).

" J. P. S.," Tarcowie, inquires as to the age when a foal suffering from a bad rupture should be castrated.

Reply—Presumably the rupture is in the purse, in which case the sooner the foal is castrated the better, for two reasons. First, the longer it stays the larger the ring becomes. Second, there is a risk, and the earlier in life the less this is ; also if it dies less keep has to be accounted for. If valuable, it would be best to have a qualified veterinary surgeon in to operate ; if of little value, starve for 24 hours, put on back, get bowels well up ring into belly, make small cuts in skin and inner skin so that they are not in the same line, and sew them up separately after operating.

HORTICULTURE.

(Replies supplied by Mr. G. QUINN, Horticultural Expert.)

" J. F. W.," Macclesfield, asks—(1) For particulars regarding a preparation placed in bottles and hung on the trees said to destroy codlin moth. (2) For a remedy for a fungus pest which attacked and destroyed cauliflowers saved for seed.

Reply—(1) There is a preparation sold for trapping codlin moths into bottles. It is prepared in Victoria and sold under the name of " Frenler." Messrs. E. B. Cox & Co., of East End Market, are the local agents. Its efficacy has not been proved in this State, but it is under trial this season. (2) It is not possible to say what destroyed the cauliflowers you grew for seed, nor to devise a remedy. You should always forward a specimen of the diseased plant when seeking advice respecting methods of prevention.

SOME PARASITES AFFECTING FARM ANIMALS.

By F. Murray-Jones, L.V.Sc., Veterinary Department.

The subject of parasites and their effects on the lower animals is of extreme importance. Losses from this cause are very heavy, and in some years amount to a veritable scourge.

Parasites are organisms which pass the whole or part of their life living on or being nourished by other organisms. They may belong to the vegetable or animal kingdom, and in these attacks a distinction is made between those that only by accident, as it were, live on animals, and those which are unable to live or complete their cycle of existence in any other way. The former are called facultative or occasional, and the latter obligatory or constant parasites.

Animal parasites may be divided into two classes; those that live outside and those that live within the body. Zoologically, they are divided into three classes—(1) *Arthropodes,* (2) worms, (3) *Protozoa. Arthropodes* are jointed insects, *i.e.*, ticks. *Protozoa* are single-celled organisms, *i.e.*, group of *Trypanosomata,* some species of which are responsible for diseases affecting horses and other animals, *i.e.*, surra, dourine, &c.

HELMINTHS OR WORMS.

The object of this article is to deal more particularly with the second group, known as *Helminths* or worms, for it is to this group that many of the important parasites or worms affecting our stock belong. Now, the *Helminths* are divided again into two groups, the broad line of differentiation being that one are flat worms and known as *Platyhelminths,* and the other more rounded and spoken of as round worms, or *Nemathelminths.*

Reference to the following tables will quickly explain how these groups again are divided into sub-groups and families :—

Group.	Sub-Group.	Examples found in.
Platyhelminths (flat worm)	*Cestodes* (tapeworm)	Dog, cat, sheep, rarely horse
	Trematodes (fluke worm)	Sheep and cattle
Nemathelminths (round worm)	*Acanthocephalid* (thorn-headed worm)	Pig and fowls
	Nematoda (common round worm)	Dog, cat, horse, cattle, pig, and fowls
	Oxyuridæ (pin worm)	Man, dog, horse, rabbit
	Strongylidæ (strongylus worms)	Horse, cattle, dog, sheep
	Trichotrachelidæ (whip worm)	Man, dog, pig, fowls
	Filariidæ (filariæ)	Horse, cattle, dog, fowls

Illustrations from Neumann's Parasitology.

A few examples of some of these worms will be dealt with, giving a brief account of their life history, habitat (animal and organ invaded), effect and treatment where possible, and, in addition, a few general suggestions as to the means of prevention.

CESTODES.

The group of *Cestodes* present to us not only a group important from a scientific and economic standpoint, but one exceedingly interesting as to the mode of development of the individual from the time of the worm's inception to its more mature or adult existence. First of all we observe two develop-

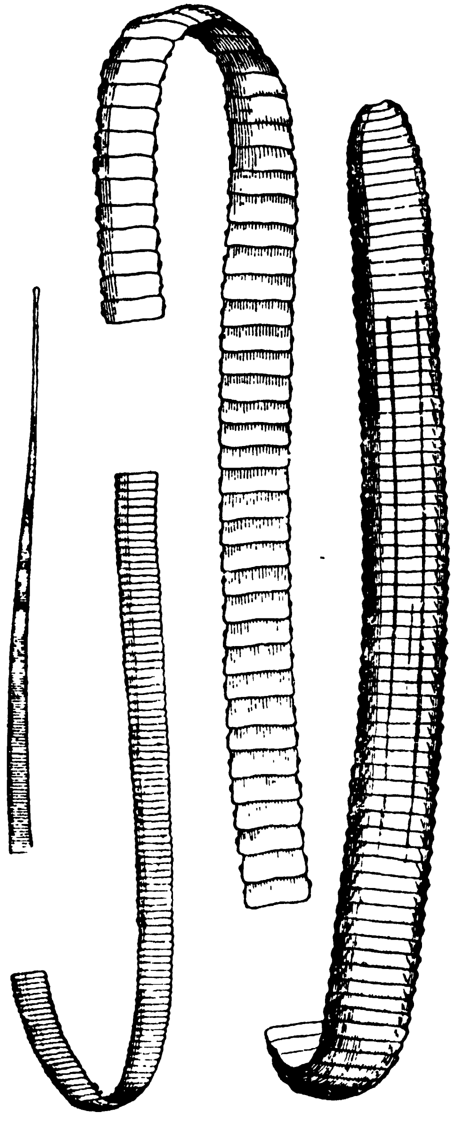


FIG. I.—TAPEWORM IN SECTIONS (*Tænia expansa*, often 20yds. to 30yds. long).

mental phases. The first, as a bladder worm and called a *Cystercerci*. Secondly, the fully matured worm. So that between one mature worm and the next one we get a cysterci. The cystic stage is found in one animal and conveyed to another as the result of ingestion of an infected organ. This cyst contains a scolex, or head. This head is armed with several hooklets, by means of which it attaches itself to the lining of the alimentary canal. From this head there grows, by a system of budding, a number of segments, and known as *Proglottides*. Those nearest the end of the worm ripen first; by this we mean, are ready to break away and discharge the eggs contained within. Now, each segment is so provided that it is able to produce the eggs of the future worm. That arrangement is one containing both male and female organs. Each segment is so furnished quite independently to the next. After ripening, the segment breaks away and may be conveyed to the outside world loaded with eggs, or it may rupture inside and so allow the actual eggs to escape. Finally, the eggs reach the ground, and, as the result of rain, may become washed into the watercourse and eventually into dams and drinking water.

A brief summary of the life cycle is as follows :—The egg, reaching the drinking water, being conveyed to another animal with water. The egg changing into an embryo in this animal becoming encysted, *i.e.*, surrounded with a bladder-like structure. Finally, the eating by another animal of organs infected with this cyst, and followed by freeing of the armed head, and from which then grows the worm composed of segments and called *Proglottides*. The point to remember is that at least two animals are needed before the tapeworm can reach maturity. To quote a few examples of the above—

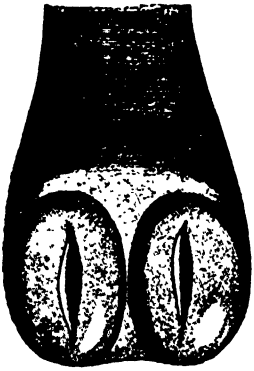


FIG. II.—HEAD OF TAPEWORM (*Tœnia expansa*). Magnified 40 diameters.

1. The tapeworm of man (*Tœnia solium*) passes its cystic stage (*Cysticercus cellulosœ*) in the pig.

2. Another of man (*T. Mediocanellata*) pass the cystic stage (*C. Bovis*) in the ox.

3. Tapeworm of lamb (*Tænia expansa*), often 60ft. long. The cystic stage is found in dogs, hares, and rabbits.

4. The tapeworm of dog (*T. Cucumerini*), most frequent of all. The cystic stage of this one is found in body of dog flea (*Pulex seraticeps*).

5. Another of dog (*T. Serrata*) lives its larvæ stage in the abdomens of hares and rabbits.

6. The *T. Marginata* of dog forms the *Cystic tenuicollis* of cattle.

7. The *T. Cœnurus* of dog, the larvæ stage being found in the brain of sheep (*Cystic cerebralis*).

8. The *T. Echinococcus* of dog has its larvæ stage in the liver and lungs of ruminating animals, and known as *Echinococcus veterinorum*.

PREVENTIVE MEASURES.

The cystic disease of pig and ox is caused by consuming food contaminated with human excreta from human beings affected with those two varieties of tapeworm. This fact argues for the higher standard of sanitation being maintained, and as far as man is concerned, the thorough cooking of meats used for human consumption. Care should be taken to prevent dogs frequenting slaughterhouses, especially in country towns, in order to minimise the chances of their obtaining offal from infected animals whereby they are likely to so further the spread of infection.

Dogs harbor the greatest number of varieties of tapeworm, and are the means of infecting sheep and cattle with the *Cœnurus cerebralis*, and cattle with the *C. Tenuicollis* and *Echinococcus.* All dogs employed with sheep should be treated periodically with worm-expelling medicines. They should be chained up whilst under treatment, and all their excreta should be carefully collected and burned. Children should be discouraged from the practice of allowing dogs and cats to lick them during affectionate embracing. The writer on more than one occasion has *post-mortemed* dogs and cats infested with worms, and yet these animals had been the constant playmates of young children where their mouths had been in mutual apposition.

Care should also be taken, where possible, to wire off kitchen gardens, especially where those edibles such as lettuces, onions, and radishes are grown. These foods are not boiled in preparing for the table use, and so the danger of infection along this path is obvious. The writer has a lively recollection of destroying a fox terrier whose constant playground had been the lettuce bed. In this case the animal's intestine was teeming with parasites. The significance in that case is apparent.

TREATMENT.

Horses are not subject to this variety of parasite to any extent.

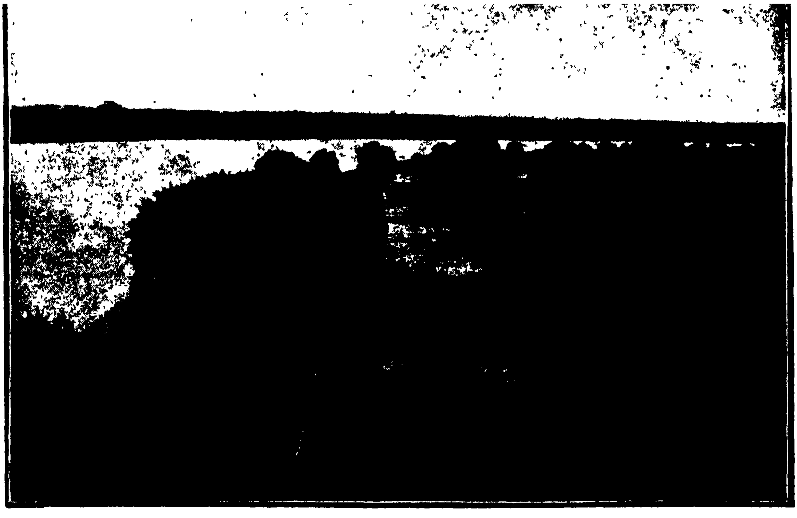
Cattle.—Free access to salt and sulphur licks and the administration of oil of turpentine and linseed oil (1oz. turpentine to 4ozs. linseed), mix, and give in feed every second day for a week.

Sheep.—Remove sheep, especially lambs, away from infected paddocks. Place the following mixture in troughs easy of access as a lick :—Sulphate of iron 1lb., sulphur 8ozs., salt 2lbs. The best way, perhaps, is to make up this mixture in a kerosene tin and give 2ozs. per head per day for 10 days with food.

Dogs.—Strict attention to prevent eating diseased offal. This will apply more to country than to the city with a strict system of meat inspection. Chain animal up for a day or two before treatment on starvation ration. Administer from 1oz. to 3ozs. of castor oil, according to size of dog. Give ½oz. to 2ozs. of turpentine beaten up in yolk of an egg. Follow up next day or two with 1oz. to 2ozs. castor oil. Regulate dose to size of dog.

Cats.—Teaspoon to tablespoonful castor oil. Follow with 6 grains areca nut in saucer of new milk. Give two doses and follow with another dose of castor oil.

(*To be continued.*)



River Murray Reclamation Works.

FARM BUILDINGS.

STABLE, MACHINE SHED, AND BARN.

At a meeting of the Green Patch Branch of the Agricultural Bureau, held on October 24th, Mr. C. J. Whillas (Hon. Secretary) read a paper on and submitted plans of a farm building, including stable, barn, and machine shed, as follows :—

" No standard type of building can be laid down to suit all farms, for conditions vary in almost every case, such as building material most cheaply available, the depth of the owner's pocket, and his notions of what is necessary and expedient for his purposes, and the owner's experience and ability at construction work, for in most cases he has to do his own building.

" A farm stable should protect the horses from rain, extreme cold and heat, be perfectly dry, and well drained underfoot, be economical of labor for feeding and handling horses and cleaning out, and, in addition, should have a feeder that will not waste chaff, should have stalls so that the strong horses cannot bully the weak, and should be, but seldom is, fowl proof.

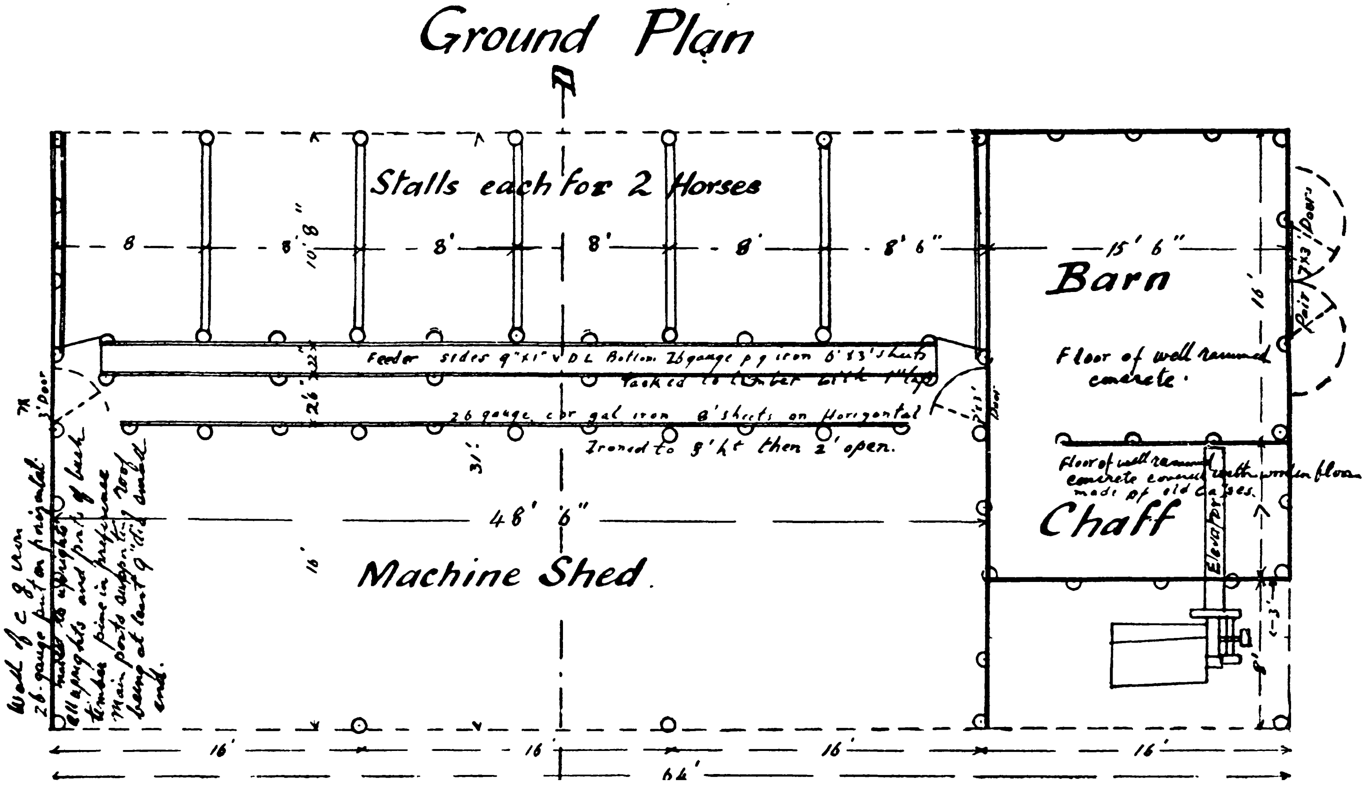
" The barn and chaff shed should be of ample dimensions to store more than a season's supply of seed, grain feed, and super., and at least five tons of chaff ; keeping all perfectly dry and mouse proof. For the barn and chaff shed I prefer iron to stone, as the latter is difficult to keep mouse proof. A brush or straw shed for this purpose is quite unsuitable.

" When the material is close at hand and can be had for the cutting, no doubt a well and strongly built shed of heavy forks and rails, and covered with straw for stables, walling in the end and back behind the feeder with a stone wall, would prove the most suitable. The stalls should be 6ft. wide, with a separate feeder for each horse of 3ft. x 2ft. x 2ft. deep, made of old cases and fitted with a lid, and seated between posts and rails at 1ft. above the ground, so that it can be taken out and upset for cleaning out. Stables, where possible, should have their back wall behind the feeders facing the coldest winter storms.

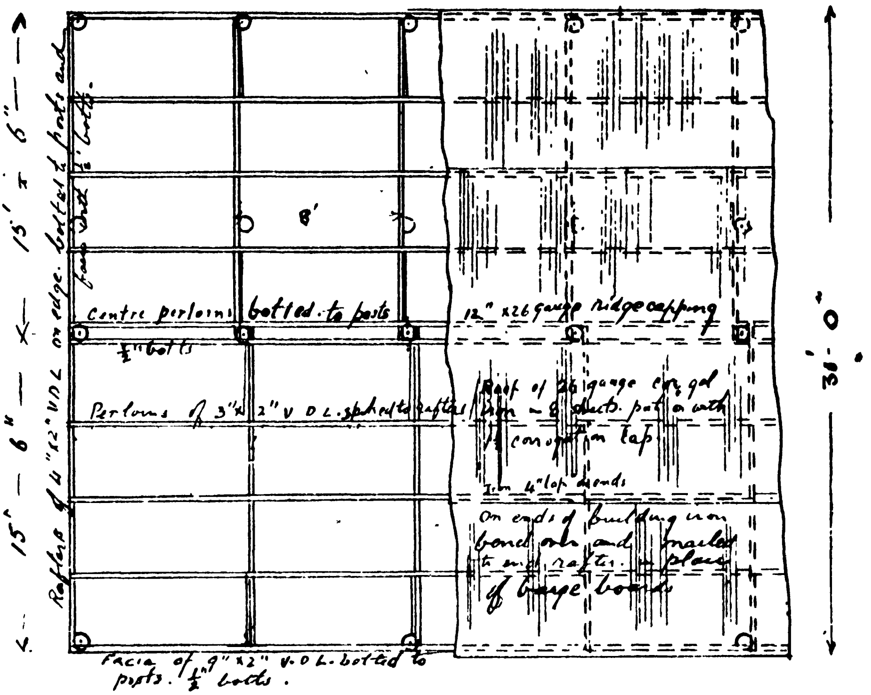
" My own stable is of stone walls and iron roof, and faces the opposite way ; but is walled behind the horses, with a door and gangway behind the stalls wide enough for a dray to come in to clean out the stables. On the open side, behind the feeder, is wire netted, and the building is therefore fowl proof when all the doors are kept shut. The main thing against straw-roof stables and machine sheds is their danger to fire ; also they give no water catchment where the same is required.

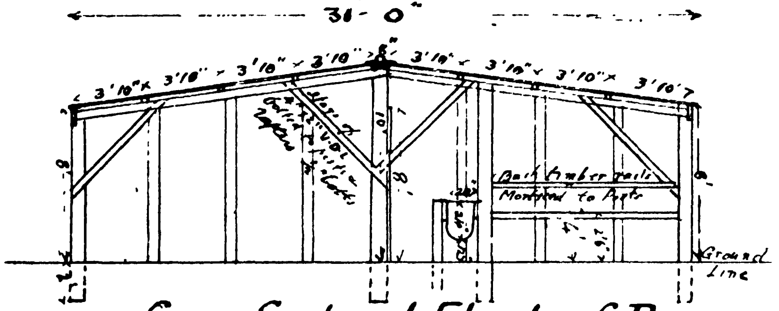
FARM STABLES, MACHINE SHED, AND BARN.

Scale, $\frac{1}{16}$in. to 1ft.

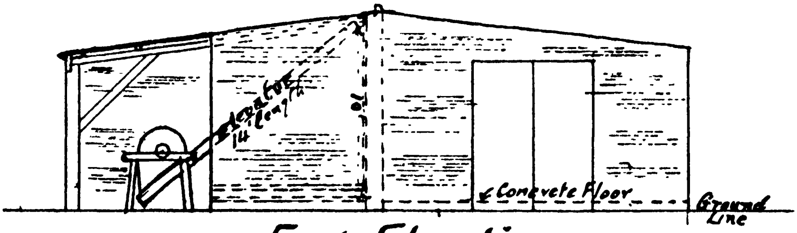

Ground Plan
A
Stalls each for 2 Horses
8
8'
10' 8"
8'
8'
8'
8' 6"
15' 6"
Barn
Floor of well rammed concrete.
Pair 7x3 Doors
16'
Feeder sides 9"x1" V D L Bottom 26 gauge p g iron 6' x 3' sheets tacked to timber with 1" lap
2' 2"
2' 6"
26 gauge cor gal iron 8' sheets on Horizontal Ironed to 8' h't then 2' open.
3' Door
A
7' 2" Door
31'
48' 6"
16'
Machine Shed.
Floor of well rammed concrete connected with wooden floor made of old cases.
Chaff
Elevator
3'
8'
16'
16'
16'
16'
64'
Wall of c g iron 26-gauge put on horizontal. nailed to uprights. All uprights and parts of bush timber pine in preference. Main posts support roof being at least 9" dia. end.

Half Plan shewing Roof & Roof Timbers


15' – 6" – 15' – 6"
Rafters of 4"×2" V.D.L. on edge. bolted to posts and face with ½" bolts.
8'
Centre perloins bolted to posts
½" bolts
Perloins of 3"×2" V.D.L. spiked to rafters
12"×26 gauge ridge capping
Roof of 26 gauge corr. gal. iron – 8 ft. sheets put on with 1½ corrugation lap
Iron 4" lap at ends
On ends of building iron bent over and nailed to end rafters in place of barge boards
Facia of 9"×2" V.D.L. bolted to posts. ½" bolts.
31'-0"


31'-0"
3'10"
3'10"
3'10"
3'10"
6"
3'10"
3'10"
3'10"
3'10"
Braces of 4"×2" V.D.L. bolted to posts & rafters ½" bolts
10'
8'
8'
Back timber rails Mortised to posts
Ground Line

Cross Sectional Elevation C.D

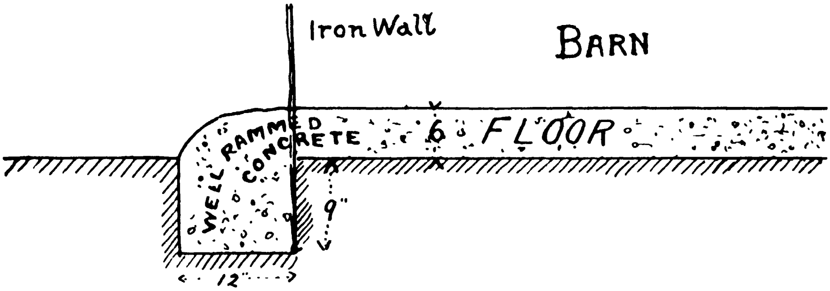


End Elevation

" NOTES ON PLAN.

" The design is for one galvanized iron building of 64ft. x 31ft. over all dimensions, in which will be stabling for 12 horses, a machine shed 48ft. x 16ft., barn and chaff room 15ft. 6in. x 23ft., and cover for chaffcutter, and which can be used for shearing if necessary. Throughout I have endeavored to cut the cost down to the finest limit. All uprights shown are for bush timber —pine, gum, sheaoak, mallee, or whatever may be available, provided it will stand in the ground and can be got fairly straight. If bush timber is not available then substitute jarrah, using 4in. x 4in. for the main uprights supporting roof, and 3in. x 1½in. for the studs that just have the wall iron to carry. In the plan the latter are shown as a round post split in two. Using jarrah uprights would add about £5 to the cost of the material. The wall iron is shown nailed on horizontally, this requires less timber and better stays the building than iron on vertically. The roof iron should be given 1½in. corrugation lap.

" All the roofing timber shown is V.D.L. (Tasmanian stringybark). This is stronger and much cheaper than oregon, but is not so nice to work, nor will it make so neat a job. The stalls are shown 8ft. wide, each for two horses ; 4ft. is plenty wide enough for a horse to feed, but not to lie down in. If single horse stalls are required they should be 6ft. wide. The barn and chaff room as shown are floored with concrete. Over the concrete in the chaff room put a removable floor, made of old packing cases nailed to 1½in. x 1½in. V.D.L. slats. In the barn, of course, dunnage would be used under any grain, etc, stored therein. To make the barn more or less mouse proof, trench for iron walls 9in. deep x 12in. wide all round the outside walls, then iron from the bottom and fill up the trench with concrete to 6in. above the ground level, as shown in the sketch.

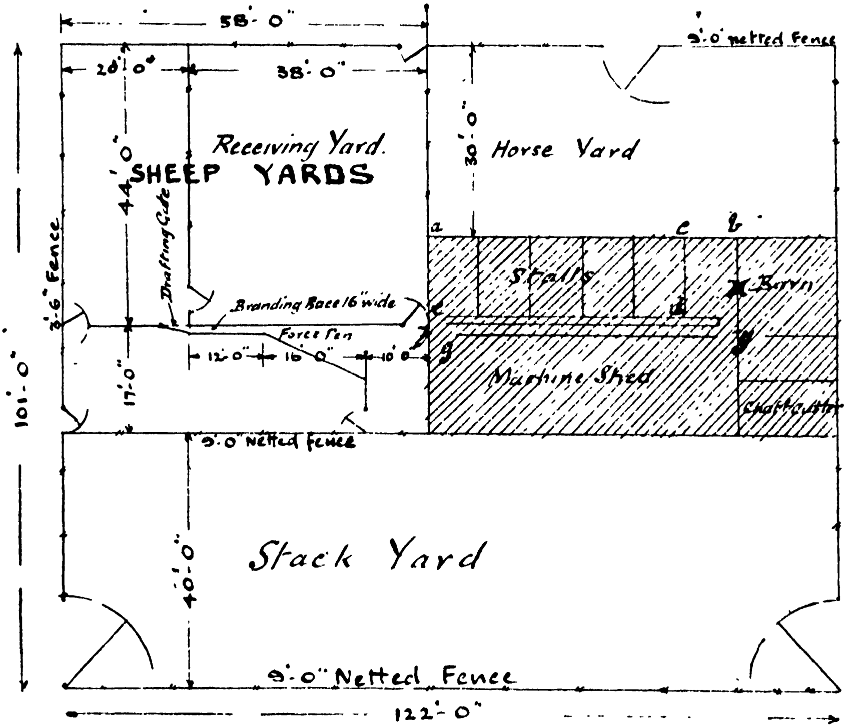


" Also cover all roofing timber leading to the barn from other parts of the building with plain galvanized iron, or any old tinned iron, for at least 18in. of its length. The doors to the barn would require to fit neatly to the door sill. A surer mouse-proof barn could be constructed by using a strong wooden floor supported by a number of short posts 2ft. above the ground level, all posts being covered with plain galvanized iron for 18in. of their height. This would be an expensive floor and would lessen the head room of the barn and chaff room.

" To use the building for shearing, follow the general plan, and erect a hurdle across the front of the stable *a b* and first stall *c d*, put grating in this stall for catching pen. At *x* in barn wall have a removable panel, say 6ft. x 3ft., which must be made a fixture when shearing is not being done and the horses have the run of the stable. Put the removable wooden floor from chaff room down in the barn for shearing on. Then operate as follows :—Force the sheep from the small yard through door *z* in end of feed gangway into the horse stalls *a c d e*, using this as a sweating pen, and the first stall as a catching pen. Pull the sheep through panel *x* into the barn and shear in the barn, letting the shorn sheep back through the door at *y* into the gangway behind the feeder, and thence to branding yards.

GENERAL PLAN SHOWING YARDS.

Scale, 20ft. to 1in.



- " Should the stable and barn be required at shearing time, shearing should be done at *g*, in the machine shed, making a small catching pen in the gangway behind the feeder, and using a tarpaulin to shear on.

"The material required for this building, omitting bush timber for uprights, is as follows:—33cwts. 26 gauge 8ft. sheets corrugated galvanized iron; eight sheets 6ft. x 3ft. plain galvanized iron, 26 gauge; 12 lengths 12in. ridgecapping, 26 gauge; V.D.L. timber as under—6/16ft. of 9in. x 1in., 18/16ft. of 4in. x 2in., 9/14ft. of 4in. x 2in., 32/16ft. of 3in. x 2in., 8/16ft. of 9in. x 2in., 7/16ft. of 1½in. x 1½in.; bolts, ½cwt. 9in. x ½in. and ½cwt. 4½in. x ½in.; 17 packets of 2in. spring head nails; 10lbs. 5in. wire nails; two packets 1in. clouts; 4/7ft. x 3ft. ledge doors of ⅞in. Baltic, fitted with T hinges (doors could be made of old packing cases if necessary). The cost of this material in Adelaide would be about £50."

POULTRY NOTES.

By D. F. Laurie, Government Poultry Expert and Lecturer.

The Year 1913.

Many events, interesting to poultry breeders, have happened during the year. Space does not permit any extended reference. A few of the salient features are—

Excellent Prices for Eggs and Poultry.—On the whole the prices for eggs were lower than during the preceding 12 months; but at no time has the market precluded profitable production. The quality of an increasing proportion of the eggs sent to market has shown satisfactory improvement. Despite the strenuous efforts to educate producers and the collecting trade, it is noticed that city merchants are still complaining of the large numbers of inferior eggs coming to the city. The unfortunate part of the business is that the careful breeders suffer, while the grossly careless people come off scathless. The superiority of the infertile egg is well, but still insufficiently, recognised. It would seem that some city and suburban stores would rather sell eggs of doubtful quality, to the annoyance of their customers, than give a little extra to encourage the production of infertile, high-grade eggs.

The price for table poultry shows a decided advance on the previous year. The growth in the quantity of poultry consumed in the city and suburbs is a sign of the times. Householders are becoming aware of the dietetic value of poultry, and also appreciate the benefits derivable from a change of the old-time constant *menu* of butcher's meat, which is now dear. Old hens and birds of generally inferior quality have sold at prices which must be more satisfactory to the seller than to the buyer. Plumper and younger birds have changed hands in thousands at prices which would, a few years ago, have been deemed absolutely prohibitive. So far we have been classed as an egg-producing State ; the future will witness a strong movement in the direction of production of better quality table birds, through the distribution of the recognised all-round, or general purpose breeds.

Country Breeders.—A few years ago in most country centres there were fanciers who bred for exhibition chiefly ; many of these remain. Farmers generally kept fowls and other poultry, and paid but scant attention to questions of breed and strain. During the 12 months under review a large number of country residents have devoted attention and some capital to the breeding of poultry on modern lines. At times it has been difficult to keep pace with the demand for information, and for plans of yards and houses. This is a most satisfactory state of affairs. It is due to the fact, mainly, that it has been demonstrated that there is a science in handling poultry, and that the results are as sure as the results of any other agricultural operation, and are very profitable. There is every proof that the demonstration work on the poultry station, the articles in the *Journal*, official reports, and the general work of the department are chiefly responsible for the excellent movement now in such strong evidence.

Concentration of the Poultry Stations.—This important event received Government approval early in the year, and ever since the whole poultry staff have experienced most strenuous times. The justification of the centralisation of all educational and demonstration work is evident, and time will add ample proof. A few local people may feel grieved that a certain station is no more, but it must not be forgotten that most country people visit the city at intervals, and the facilities for visiting the conveniently central poultry station at Parafield will be availed of by hundreds, where previously the numbers could be counted in scores only. Duplication of any experimental work is unbusinesslike, and serves no good purpose. Experiment on the larger scale now possible will be more in accord with commercial requirements. To be of high value all such work requires constant supervision, so that all facts may be noted and recorded.

Country Lectures.—In former years one addressed small audiences of the chosen few, as a rule. During the last few years the attendance has largely increased, and has been thoroughly representative of the whole producing community. Many localities have been, by special invitation, revisited, generally for the purpose of giving an address on the higher and often complex scientific features of poultry-breeding. There is perhaps no sign more pregnant of future advancement than the growing inclination now so prevalent among our producers to learn the exact why and wherefore. Unfortunately, science, which precisely means knowledge of facts, is by some confused with theory, which may not deal with ascertained facts.

Unlimited Expansion.—Some people have timorously expressed the opinion that the great growth of poultry-breeding establishments may mean a general state of overproduction, and consequent low prices. Such an idea is erroneous. There is room for unlimited expansion. Our production is barely in the infant stage as yet. When we have ten or fifty times the quantities of good eggs and table poultry, there will be more organised effort in exploiting the many excellent markets. It must be always remembered that poultry products are chiefly eggs and meat, *i.e.*, food. The people of the earth are increasing and multiplying, and to feed them is the problem of the future.

GENERAL ADVICE FOR 1914.

Resolve to improve your methods generally. In breeding you cannot stand still—you must go forward, or you will recede.

Breed only from the very best specimens for the purpose you have in view.

House your birds on modern principles, and remember this is of high importance. Feed your birds scientifically, and remember that table birds and layers need different treatment.

Read all you can, but be careful that you select wise teachers.

Cultivate the faculty of observation. Note all details, and commit them in concise form to writing. Recorded facts are of the highest value for future comparison—some memories are treacherous.

Do not blunder along in ignorance. If you do not know, it is not at all derogatory to ask advice. Many who would fain pose as experienced breeders would derive much benefit from the advice of those who know.

Eradicate all vermin. Wage ceaseless warfare against these parasitic disease distributors. Deal promptly with diseases. You must stamp these out by following nature's plan. The unfit should not be assisted to survive, but should be absolutely eliminated. Learn this lesson; it is perhaps the most important.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, to terminate March 31st, 1914.]

Competitor.	Eggs Laid for Month ended Dec. 31st.	Total Eggs Laid from April 1st, 1913, to December 31st, 1913.
SECTION I.—LIGHT BREEDS		
White Leghorns.		
Hurford, E. W., Grangeville	102	971
Hammill, H., Kogarah, New South Wales	119	1,025
Carter, A. A., Keswick	112	779
Robins, G. W., Hawthorn, Victoria	105	1,004
Dunn, L. F., Keswick	103	965
McKenzie, H., Northcote, Victoria	111	1,053
Cowan Bros., Burwood, New South Wales	107	955
Robbins, G. W., Hawthorn, Victoria	112	884
Pettigrove, T. A., Northcote, Victoria	124	979
Eckermann, W. P., Eudunda	74	779
Robertson, F., New Hindmarsh	116	835
Pettigrove, T. A., Northcote, Victoria	79	892
Cant, E. V., Medindie	85	836
Schäfer, N. H., Strathalbyn	95	951
Redfern Poultry Farm, Caulfield, Victoria	123	944
Chapman, G. H., Port Pirie	89	651
Lewis, F. M., Caulfield, Victoria	134	921
Redfern Poultry Farm, Caulfield, Victoria	117	1,036
Hagel, W. C., Mallala	133	959
Hocking, E. D., Kadina	115	801
Sargenfri Poultry Yards, East Payneham	126	906
Joass, W. A., Rothbury, New South Wales	116	973
Bennett & Furze, Wright Street, Adelaide	93	892
Jury, W. H., Torrensville	97	931
Olive Poultry Farm, Freeling	123	958
Kelly, Mrs. W. J. L., Quorn	77	566
Indra Poultry Farm, Freeling	105	1,122
Electricum Poultry Yards, Glenelg	73	844
Sargenfri Poultry Yards, East Payneham	108	1,030
Moritz Bros., Kalangadoo	133	1,055
Brown, S., Gembrook South, Victoria	87	915
Matthews, H. G., Fullerton	99	972
Harris, J. G., Black Forest	84	986
Tockington Park Poultry Farm, Grange	93	945
Bradley, J. E., Newport, Victoria	120	1,075
Miller, B., Parkside	93	801
McKenzie, E., Northcote, Victoria	130	1,164
Tockington Park Poultry Farm, Grange	123	1,038
Provis, W., & Son, Tumby Bay	136	1,017
Hillcrest Poultry Farm, Brighton, Victoria	120	996

EGG-LAYING COMPETITION—*Continued.*

SECTION I.—LIGHT BREEDS—*Continued.*

WHITE LEGHORNS—*Continued.*

Competitor.	Eggs Laid for Month ended Dec. 31st.	Total Eggs Laid from April 1st, 1913, to December 31st, 1913.
Beadnall Bros., Gawler	96	811
Morgan & Watson, Frankston, Victoria	100	1,089
Gibbs & Pine, Queenstown	107	719
Hillside Poultry Yards, Hamley Bridge	98	774
Hall, A. W., South Oakleigh, Victoria	122	950
Dreyer, G. H., Wolfram Street, Broken Hill	115	987
South Yan Yean Poultry Farm, Doreen, Victoria	123	992
Pope, R. W., Heidelberg, Victoria	123	1,103
Tabuteau, J. O., Black Rock, Melbourne	103	885
"Koonoowarra," Enfield	112	840
Hagger, J. C., Orroroo	130	1,020
Bertelsmeier, C. B., Clare	110	915
South Yan Yean Poultry Farm, Doreen, Victoria	113	977
Jelliff, Mrs. T., Beverley, Adelaide	124	1,025
Hughes, J. J., Elsternwick, Victoria	131	916
Stewart, J. R., Thirlmere, New South Wales	120	829
Aveling, T. B., Quorn	112	723
"Nunkerowi," Neales Flat	119	759
Prior, D., Moonta Mines	99	796
Leonard, W. J., Port Pirie	122	880
Barkla, L. W., Gawler South	126	838
Foreman, E., Hindmarsh	126	902
Broderick Bros., Gawler	91	750
Tubb, E. C., Frewville	103	778
Harfield, B. L., Pinnaroo	120	785
Foreman, E., Hindmarsh	115	847
Tomlinson, W., Westbourne Park	107	914
Woodhead, H., Torrensville	97	977
Padman, A. H., Hyde Park	131	949
Franklin, G., Norwood	96	938
Mathias & Weller, Unley	90	769
Messenger, A., Port Adelaide	135	1,004
Albion Poultry Farm, Magill	97	909
Dunstan, L. A., Port Pirie	116	835
Trenwith, T. H., Kadina	97	728
Purvis, W., Glanville	116	1,011
Rice, J. E., Cottonville	105	900
Evans, H. A., Richmond	130	862
Miels, C. & H., Littlehampton	122	946
Swift, W. G., Northcote, Victoria	124	1,022
Bertelsmeier, C. B., Clare	128	925
Brundrett, S., Moonee Ponds	140	889
Glenelg River Poultry Farm, Mount Gambier	116	871
Padman, A. H., Hyde Park	112	885
Purvis, Miss Gracie, Glanville	136	874
Braund, J. E. & H. J., Islington	136	[illegible]
Ontario Poultry Farm, Clarendon	97	703
Brock, A. G., Hamley Bridge	111	791
Russell, E. L., Salisbury	109	883
Schwabl, J., Elsternwick, Victoria	129	946
Moritz Bros, Kalangadoo	116	919
Craig Bros., Hackney	113	887
Codling, H., Mitcham Park	80	631

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended Dec. 31st.	Total Eggs Laid from April 1st, 1913, to December 31st, 1913.
SECTION I.—LIGHT BREEDS—*Continued.*		
White Leghorns—*Continued.*		
Tidswell, H. J., Clarence Park	90	673
Bennett, E. V., Kalangadoo	121	870
Lillywhite, R. G., Malvern	113	818
Harris, A. W., Mallala	119	927
Hagger, W. H., Malvern	102	927
Winter, W. C., (Nalpa), Strathalbyn	63	559
Whitegate Poultry Farm, Deepdene, Victoria	122	870
Brown Leghorn.		
Toe, C. E., Brighton, Victoria	112	558
Black Minorca.		
Whitrow, A. J., Knoxville	61	714
SECTION II.—HEAVY BREEDS.		
Black Orpingtons.		
Neville, A. B., Fullarton	77	783
Thornton, W. J., Kew, Victoria	70	766
Kenway, D., West Pennant Hills, New South Wales	96	1,014
Martin, B. P., Unley Park	93	880
Cowan Bros., Burwood, New South Wales	109	867
Tockington Park Poultry Farm, Grange	98	765
Pearson, W. S., Kingswood	81	744
Hall, A W., South Oakleigh, Victoria	84	725
Padman, J. E., Plympton	83	802
Greaves, W. E., Prospect	78	575
Bertelsmeier, C. B., Clare	59	446
Coto, T. W., Myrtle Bank, Victoria	93	887
Convent of the Good Shepherd, Oakleigh, Victoria	91	736
Buff Orpingtons.		
Hocart, F. W., Clarence Park	73	672
Silver Wyandottes.		
Dunn, L. F., Keswick	79	818
Western, F. C., Marion	77	659
Kappler Bros., Marion	65	611
White Wyandottes.		
Bradley, J. E., Newport, Victoria	97	836
Black Langshans.		
Stevens, E. F., Littlehampton	94	749
Faverolles.		
Williams, W. H., Frewville	75	566
Dorkings.		
Cathcart, J. F., Newburg, Scotland	79	593

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended Dec. 31st.	Total Eggs Laid from April 1st, 1913, to December 31st, 1913.
SECTION III.—PRODUCERS.		
Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.		
WHITE LEGHORNS.		
Broster, G., Mallala	92	838
Carling, R., Kangaroo Flat	125	1,001
Rowe, J., Long Plain	125	943
Broster, G., Mallala	104	892
Gilbert, F. W., Kangaroo Flat	97	970
Campbell. J. D., Barabba	120	982
Forest Leigh Poultry Farm, Jamestown	102	751
Kerr, R., Longwood	131	967
Carling, Mrs., R., Kangaroo Flat	104	983
Rowe, J., Long Plains	116	928
Gill, R., Marrabel	98	768
Wurst, G. H., Marrabel	95	863
Sherrah, E., Long Plain	105	832
Rowe, N., Long Plain	97	900
Shepherd, R. H., Balaklava	113	871
Lacey, F. C., Kybybolite	52	777
Bertelsmeier, O. O., Booborowie	113	891
Dunn, H. J., Black Springs	110	751
Rackham, C. Naracoorte	94	969
Holmes, F. A., Naracoorte	66	696
Hutchison, W. J. S., Naracoorte	83	627
"Herdsfield," Mount Gambier	118	1,019
Smith, R. L., Hynam	91	711
Gill, Mrs. J., Kapunda	80	714
Sampson, C., Kooringa, Burra	147	1,059
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	70	576
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	65	744

D. F. LAURIE, Poultry Expert.

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PARAFIELD EGG-LAYING COMPETITION.

MONTHLY REPORT.

HEALTH.

The general health has been good. There have been a number of deaths due to various causes, such as vent gleet, oviduct troubles, wasting, two from heat apoplexy, and two found dead from no apparent cause.

BROODINESS.

As might be expected at this season of the year, there are numerous cases to record ; but the total, 153, is less than during November, when there were 160 cases. The various sections contributed as follows :—Section 1, 64, as against 68 ; section 2, 70, as against 75 ; section 3, 19, including four Black Orpingtons and four Langshans. All the Leghorns which become broody are marked, so that their owners can discard them as breeders later on.

MOULTING.

A few of the pens are showing signs of a light moult. It is probable that moulting will be early this year. An early moult is desirable from the breeder's point of view.

WEATHER.

The weather, generally, has been seasonable ; there were a few very hot days, and heavy rain, 1·97 points, most of which fell during a short period, when 83 points were recorded.

VISITORS.

Twenty-two persons visited the station—a total to date of 776.

LAYING.

The ninth month has now passed, and although there is a seasonable falling off in the grand total, viz., of 1,048, as compared with the yield for November, the averages are still better than for the same period at Roseworthy last year. The scores are :—Section 1, 11,244 ; section 2, 1,754 ; section 3, 2,713 ; total, 15,711 ; as against November. 16,759. For the corresponding period last year at Roseworthy Poultry Station the pen average was 863·6 from 103 pens of White Leghorns. This year from 102 pens of the same breed the average is 886·3, that is an increase per pen of of 22·7 eggs. The heavy section pen average last year was 688·8, and for the same period this year it was 732·7 ; an increase per pen of 43·9 eggs. The outstanding feature so far is the consistent laying of the leading pen, which has for the period, viz., nine months, established a fresh record for this State. This pen's total for nine months is 1,164, as against the previous highest, 1,158. Of course much may happen during the three months before the termination of the test. Whether a new record will be made is a matter for the future. What appears likely and, to my mind, far more satisfactory from the larger point of view is that the general average will be high, and that there will be a good many pens with large scores. When it is remembered that this is the biggest competition ever organised, and containing 300 more birds than have elsewhere competed, the results to date may be deemed satisfactory and the prospects encouraging.

1914–15 LAYING COMPETITIONS.

Section 1 is open to the world. Breeders are requested to make their entries as soon as possible, as the number of pens is limited. Ten pullets in a pen. Entry fee, 10s.

Section 2 is for competition among farmers, pastoralists, fruit and vegetable growers. Producers should support this section by entering ten pullets ; fee 10s.

Section 3—Single testing light breeds. Only 30 entries in this section can be received. Six birds each entry. Fee 20s.

LADS FOR SOUTH AUSTRALIAN FARMS.

By Thos. E. Sedgwick.

No better example could be shown of an ounce of fact being worth more than a pound of theory than to state the history of placing town lads on farms. When the idea was first mooted, four years ago in England, it was decried by social students and others, who regard themselves as experts, as impossible—foredoomed to failure. It was alleged that the boys would drift back to the town, that they would not take kindly to farm work, and that the farmers would illtreat them in every way. A committee of managers of lads' clubs, brigades, and other associations was formed to draw up a scheme and to advance the idea as far as possible at home. They were convinced that the securing of permanent prospects and employment and good conditions of life were far more desirable to the recipients than merely affording them an opportunity for relaxation and physical development in some of their spare time. As, however, there were and still are far too many workers at home for the situations available, and casual work is the rule rather than the exception in many callings, it was obvious that no improvement in this direction could be attained without the co-operation of the Governments over seas. As a 12 month's correspondence produced no tangible result, it seemed to me to be necessary to come out to Australia to plead the cause of the lads in person. The New Zealand Government agreed to try a small party of 50 lads as an experiment, and to the proposal that these should be apprenticed to selected farmers under Government supervision, they tacked the banking of wages (except for pocket money), so that each lad at the conclusion of three years will have from £80 to £100 saved. Within the first two months of their arrival applications were received from farmers for another hundred similar lads, although there were no applicants at any of the labor exchanges throughout the country for farm work. The farmers with whom the 50 boys were placed are more than satisfied, and the lads themselves cannot speak in too high terms of praise of the treatment they have received since arriving in New Zealand.

The value of town lads for farm work having thus been proved, the matter has been advocated in the different dominions of the Crown. The Government of Victoria, who, in the middle of 1909, were unable to do anything with regard to the immigration of lads, are now prepared to place 3,000 British lads in the current year, provided they are of good character, intelligent, healthy and well-developed, and willing to take up farm work. They at first received small contingents of unemployed lads from England who gave considerable satisfaction, and they find that those who are willing to relinquish situations they hold in order to come out to Australia give even better results. The great difficulty has been that the people in England do not like to advance money to lads unless they are assured of its being collected back by officials in Australia ; and provided the money is so collected back, there does not seem to be any reason why it should not be advanced by the Government responsible for so recalling it. The younger the lads are brought out, provided they are over 15, the better they will settle, and the more useful they will be in the house as well as on the farm. As wages are too low in England to enable the lads to save their fares this can only be done by advancing the amounts, to be collected back out of wages ; which is quite easy to do under apprenticeship.

It is evident that junior migration is now becoming the leading feature in the better distribution of the population of the Empire. The cost of supervision is greater, but the added advantages compared with adult migration more than compensate for the extra expense involved. The State gets a longer life for the same fare ; young people settle best, and adapt themselves most readily to new environment. They also act as centres of immigration to their friends and relatives from home. They learn to save, settle, and, in the natural course of events, marry. Being young, they can take up virgin land in the back blocks, which men with families find it impossible to do. All their children being born under the Australian sun are healthier and their fares are saved. Lads are better able to repay their fares after arrival than are married people, and they can make a sufficiently good place in the world to keep them free from the old age pensions. Coming to the country before they are fully grown they are able to expand to their fullest development. Town lads, especially, have nothing to unlearn, learn quickly, and are willing and speedy. After a month on the land they know more of rural work than lads who were born in the country at home have ever learned. The latter also are never able to acquire that quickness, both of mind and body, which can only be engendered by life in a busy city.

Perfection in junior migration is only to be attained by care in the selection at home, in the supervision on the voyage, and in placing out lads.

Every young person should know the conditions under which they will have to work and live, and should understand the hours, distance from town, and climate. The picture should not be painted in too rosy colors. Supervision on the voyage keeps the young people fit, keen, and out of mischief.

The best form of placing out is apprenticeship to carefully selected employers, those from one place or district at home being placed in the same area of distribution here. Before any agreement is signed, the boys should be tried with their employers for a month, and the agreement should stipulate—

(1) That the employer should be at liberty to request the official responsible for the young people to remove them if they are guilty of misconduct sufficient to justify an ordinary employé being dismissed.

(2) That the official should be at liberty to cancel the agreement and to remove the boy if he considered they were in any way not being properly treated.

(3) That the wages should be banked (except pocket-money) in the joint names of such official and the individual employé. This encourages thrift, prevents a panic, running away to town, and provides a nucleus for future settlement.

Apprenticeship secures the workers to the employers who have trained them, and assures their being properly taught. It is of advantage to all concerned, especially those in the town.

The South Australian Government have now decided to develop this form of migration, and have recently passed an Act of Parliament to enable it to be done more efficiently. The amount of the assisted fare will be payable out of wages after arrival, and for the next few years the wages will be paid to the Treasury on the boys' account, where the amount so deposited will bear interest at 4 per cent. In the event of the boys being guilty of serious misbehaviour or of wilful neglect of duty the Minister of Immigration is empowered to fine a boy out of his wages, the money so forfeited being applied to payment of bonuses to other boys, having regard to their behaviour and attention to duty. The Minister can also place any boy in an institution if he thinks that such a course is desirable. Any persons who counsel or induce lads to abscond from their employer, or to break their agreement, or in other ways assist them therein are liable to a fine of £20 or imprisonment.

At the conclusion of the apprenticeship, which will be for at least 12 months and not more than three years, the lads will be able to take up farm work at men's wages, and will have a nucleus saving of about £30 a year on the average, to which they will be able to add sufficient in a few years to enable them to take up some new country on their own account; and it is hoped that many of the boys will join their forces and take up adjacent holdings, so as to avoid the loneliness which is usually experienced by pioneers, to exchange their labor, and so keep down the cost of clearing, and to purchase requisite machinery on a co-operative basis.

A small experimental party of 81 of these boys were tried in South Australia this year without apprenticeship, and after they had been in the country for four months a satisfactory report was received from the Immigration Officer as to their repayment, behaviour, and general results.

THE APPRENTICESHIP AGREEMENT.

The Commissioner of Crown Lands and Immigration (Hon. Fred. W. Young) has arranged for full particulars with regard to the conditions of

apprenticeship of lads to be placed with farmers under the Immigration Act Amendment Act of 1913, and copy of proposed apprenticeship agreement to be published in the next issue of the *Journal.* Farmers and other producers desirous of obtaining a boy are invited to communicate with the Immigration Officer, Crown Lands Office. The first party of lads will probably arrive in May, 1914, and to avoid disappointment early application is advisable.

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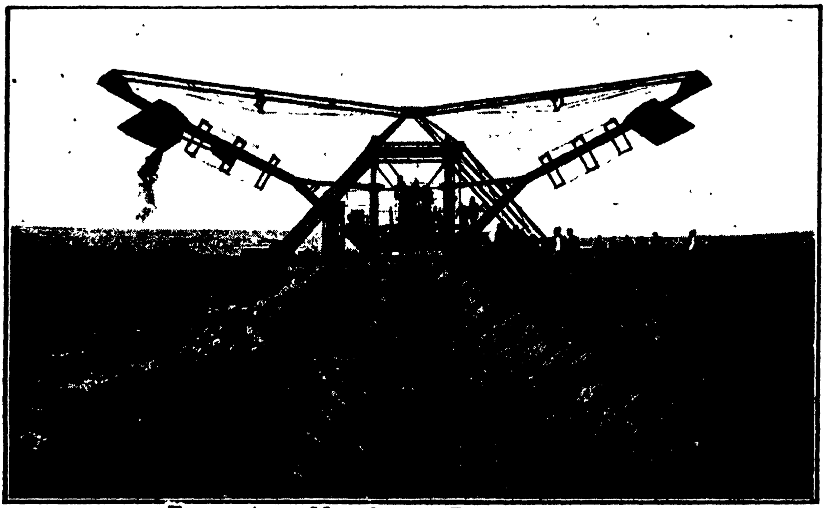

Excavator, Mypolonga Reclaimed Area.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, December 10th. In the absence of the Chairman (Mr. G. R. Laffer), Mr. F. Coleman (Vice-Chairman) presided. Others present were Professor Perkins, Col. Rowell, Messrs. C. J. Valentine, A. M. Dawkins, C. E. Birks, and J. Miller, and the Secretary (G. G. Nicholls).

Fruit Exports.

The following resolution from the Forest Range Branch of the Bureau was tabled :—" That the Advisory Board be asked to bring under the notice of the proper authorities the weakness of the Commerce Act in allowing small and unsound fruit to be shipped to oversea markets, and that the inspectors be given power absolutely to prohibit the shipment of unsound fruit." In an accompanying note the Branch remarked—"At the present time it is possible to ship any sized apples, providing they are branded as being under 2¼in. According to a circular issued by an exporting firm, apples shipped have been as small as 1½in. in diameter. This stuff must be injurious to the trade." It was decided to refer the matter to Col. Rowell and Mr. Laffer for a report. The former explained that a full description of the fruit was marked on each case, and, personally, he was convinced that when they realised that they got little or nothing for it growers would cease sending unsound or undersized fruit.

Experiment Farm in Drainage Area, South-East.

The Penola Branch intimated that it was in favor of a proposal for the Government to establish an experiment farm in the drainage area on the heavy land, and suggested " that about 1,000 acres adjoining and including Yallum House, which is available, would fulfil all requirements of suitable soil and central position." The communication was referred by the Board to the Director of Agriculture for his consideration and opinion.

Water for Stock.

The Secretary stated that recently, following upon a report from the Agricultural Chemist at Roseworthy College (Mr. J. H. Phillips), the Principal (Professor Perkins) had forwarded a minute to the Director of Agriculture (Professor Lowrie) suggesting that the co-operation of the various Branches of the Agricultural Bureau, particularly those in the drier areas, should be sought with a view to obtain samples of water used for stock for the purpose of ascertaining the quantity of dissolved salts which might be contained in water suitable for stock. In communicating with the Advisory Board on the subject, Professor Lowrie had remarked :—" I consider this a good suggestion. I had some inquiries made some time ago in respect to the degree of salinity of water that could be tolerated by stock, and I submit a memorandum from Mr. J. W. Jones (Secretary to the Commissioner of Public Works), giving very useful information. As evidence that the Agricultural Bureau might be used to advantage for the furthering of information on this matter among farmers, I may say that last month I received a letter from a farmer to this effect :—' I am sending you a parcel containing a bottle of water. Can you get it analysed for me ? I have a grazing property north of Darke's Peak, and water supply is from open dams. This water is taken from one of them. The dam is 320ft. long, 135ft. wide, and 16ft. deep, and when about 6ft. of water had been used out of it the remainder went bad, and we do not know what is wrong with it. It made the cattle vomit badly, and about a dozen of them died in great pain. The dam has been down several years, and this is the first time anything has gone wrong. As it was it put us in a corner, and we had to shift the cattle away quick and lively, or we would have lost the lot. It made them all bad, and besides 12 dying the others fell away badly in condition. I should like to find out what is wrong with the water.' On analysis this water was found to contain 1,122 grains of sodium chloride per gallon, and total solids 1,368 grains per gallon, which, I think, sufficiently accounted for the farmer's loss of cattle. I replied to him to that effect, and pointed out that with a little more concentration due to evaporation this water would have approximated in salinity to sea water. I shall be very glad if samples can be secured from the Branches in those districts where stock water more or less saline is used. I think it would be well to start getting samples from one or two districts only in the first instance, and working it as the analyst at the College can find time to undertake the analyses."

FOUR TESTS.

The memorandum from Mr. Jones contained analyses of water from four distinct localities, and of entirely different qualities. It stated, among other things—" No. 1 is a sample of water from Shaw's dairy farm near Woodville. The water was pumped from a depth of about 30ft. The remarkable fact is, notwithstanding that it contained a large percentage of sodium and potassium chlorides (83·40 grains per gallon) and other salts, the water was used successfully, and probably is still used, for the irrigation of lucerne. No. 2 is an analysis of water from the bore at Hergott. This water has been used for many years in watering dates, and now is used for general purposes in the township, although it shows sodic and potassic chlorides to the amount of 85·69 grains per gallon. No. 3 is an analysis of water from Nullarbor Plains, near Eucla. The water is both bitter and saline, and contains sodic and potassic chlorides aggregating 716·10 grains per gallon. It is a remarkable fact, however, that this water has been used for many years, and, indeed, is the only water available (1911) for sheep, cattle, and horses. The well is a wonderful success, and there has never been a complaint regarding the quality of the water for every purpose but that of drinking. The herbage on which the stock feed is chiefly saltbush with a little grass. No. 4 is an analysis of water from Tonkin's Well, near Tarcoola, which contains sodic and potassic chlorides totalling 646·71 grains per gallon. It is slightly better than the Nullarbor Plains water, but in this instance and this particular district the water was considered too saline for horses. It was used principally for sheep and to a small extent for cattle. I consider, and my opinion is supported by the officers of the Engineer-in-Chief's Department, whose work calls them to the country in connection with the wells and borings, that the maximum salts for sheep water should be 2ozs. per gallon, and for horses 1½ozs. per gallon. The latter is too high for horses well used to fresh water." At the instance of Mr. Jeffrey, the Secretary was instructed to ask the Northern Branches to forward samples of water that were being used and had been used for some time for livestock without ill effects.

Demonstration Plots.

The Secretary reported that half a dozen or more Branches had determined to lay down demonstration plots in their respective districts, and that others had deferred consideration of the matter until after the harvest. The former included Parilla, Myponga, Wilmington, Nantawarra, Pine Forest, Crystal Brook, and Whyte Yarcowie.

New Members.

The following gentlemen were approved as members of the Branches shown, viz., Wynarka—A. M. Thomson, S. O. Thomson, V. F. Klose; Canowie Belt—G. Heinrich, G. U. Young; Mallala—G. W. Lindsay, K. Oliver; Two Wells—E. Jenkins, jun.; North Booborowie—J. C. H. Lange, A. C. Simpson; Port Elliot—J. Brown, jun., F. E. Hargreaves, S. Trestrail; Green Patch—G. Merchant; Monarto South—P. B. Frahn, E. Leishman; Blackwood—H. A. Banks, J. S. Treloar, R. Cook; Bute—A. Bridesen, A. E. Bryans, R. W. Herbert; Georgetown—C. Wilkins; North Bundaleer—M. J. McCarthy, W. Burgess; Lyndoch—G. Wilson, G. H. Stevens; Mount Pleasant—R. Walsh; Wepowie—E. F. Brown, J. G. Crocker, F. Hetzel; Mitchell—G. Mayhew, A. Gosden; Blyth—N. O. Williams; Meadows—E. B. Ellis; Clare—W. Muller; Berri—F. R. Clark, W. Morey; Miltalie—D. Ramsey, L. Aunger; Glencoe—H. A. Agnew.

Life Members.

The distinction of Life Membership was conferred upon three members of the Meadows Branch in recognition of extended and valuable service to the Bureau, viz., Messrs. J. Catt. T. B. Brooks. G. T. Griggs.

THE WHEAT MARKET.

The English wheat market was very quiet in tone during the greater part of December. Few sales of cargoes were reported, and trade generally was characterised as dull. Locally the market was irregular, as while the average price offering was about 3s. 5½d., several buyers were prepared to give fully a penny more for prompt delivery.

Under date London, December 5th, *Beerbohm's Evening Corn Trade List* states:—"Shipments last week were again on a large scale; the proportion to the United Kingdom was only moderate, but somewhat larger than in the previous week. Unless the United Kingdom receives a much larger proportion of the Russian exports than has been the case for a long time past, it does not appear probable that the weekly shipments to this country will be really large until Australia commences shipping freely.

"One third of the season is now over, and the exports to Europe in the four months, August to November, have amounted to 25,395,000qrs., or at the rate of 1,490,000qrs. per week, against estimated requirements of about 1,275,000qrs. per week, or for the four months 21,675,000qrs. The increase has been entirely in the Continental figures, the proportion of the shipments to the United Kingdom being just about equal to the estimated requirements, as is borne out by the stocks, which now amount to 2,250,000qrs., against 2,250,000qrs. on the 1st of August. Unless native wheat has been coming forward much less freely than the official estimates of this year's crops led the trade to expect, stocks on the Continent must have increased appreciably. So far as the United Kingdom is concerned the excess in farmers' deliveries, compared with last year, has amounted to only 240,000qrs., or at the rate of 720,000qrs. for the whole season, whereas, if the official estimate of the yield was correct, the increase in the deliveries of English wheat ought already to have amounted to about 700,000qrs. Some authorities claim that there is a larger proportion of this year's English wheat unfit for milling purposes than generally believed.

"It will be seen by the tabular statement given below that the world's visible supply has increased during November by 2,050,000qrs., against an increase last year of 3,665,000qrs., and a decrease of 425,000qrs. in 1911.

THE WORLD'S VISIBLE WHEAT SUPPLY ON DECEMBER 1ST.

	European. Qrs.	U.S./Canada. Qrs.	Total. Qrs.	Eng. Average Price.
1913	9,130,000	15,030,000	24,160,000	30/9
1912	9,625,000	13,880,000	23,505,000	31/9
1911	10,035,000	13,900,000	23,935,000	32/10
1910	13,295,000	9,850,000	23,145,000	30/6
1909	8,285,000	7,500,000	15,785,000	33/-
1908	7,400,000	10,500,000	17,900,000	32/3
1907	7,730,000	8,250,000	15,980,000	34/7
1906	9,345,000	9,850,000	19,195,000	26/1
1905	8,870,000	8,550,000	17,420,000	28/8
1904	10,445,000	8,015,000	18,460,000	30/5
1903	8,620,000	7,825,000	16,445,000	26/6
1902	8,630,000	10,330,000	18,960,000	25/-
1901	9,005,000	11,625,000	20,630,000	27/1
1900	8,680,000	12,080,000	20,760,000	27/-
1899	8,230,000	11,950,000	20,180,000	25/8
1898	7,000,000	6,500,000	13,500,000	27/7
1897	8,310,000	7,100,000	15,410,000	33/8

Date.		LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
Dec.	5	Steady, but quiet; Liverpool quiet	3/5½	3/5¾	3/5¾
	6	Steadily held, not active; Liverpool firmer, no demand	Do.	Do.	Do.
	8	—	3/5½ to 3/6	Do.	Do.
	9	Firm, quiet; Jan.-Feb. buyers 4/5⅝; Liverpool firmer	3/5½ to 3/6¼	3/5½ to 3/6	3/5½ to 3/6
	10	Steady, quiet	Do.	3/5¾ to 3/6	3/5¾ to 3/6
	11	Quiet	Do.	Do.	Do.
	12	Quiet; Liverpool dull and neglected	Do.	Do.	Do.
	13	Dull and neglected	Do.	3/5¾	3/5¾
	15	—	Do.	3/5½	3/5½
	16	Very dull; no demand	3/5½ to 3/6	3/5¼ to 3/5½	3/5¼ to 3/5½
	17	Dull and neglected	Do.	Do.	Do.
	18	Dull and neglected	Do.	Do.	Do.
	19	Quiet; Liverpool no demand	Do.	Do.	Do.
	20	Quiet	3/5½ to 3/6½	3/5¼	3/5¼
	22	—	Do.	Do.	Do.
	23	Quiet; Liverpool very dull	Do.	Do.	Do.
	24	Dull	3/5½ to 3/6	Do.	Do.
	25	—	—	—	—
	26	—	3/5½ to 3/6	3/5¼	3/5¼
	27	—	Do.	Do.	Do.
	29	—	Do.	Do.	Do.
	30	Quiet, easier tendency; Liverpool very dull	3/5½ to 3/6½	Do.	Do.
	31	Quiet; Liverpool dull and neglected	Do.	Do.	Do.
Jan.	1	—	Do.	Do.	Do.
	2	Very dull	Do.	Do.	Do.
	3	Steady, but quiet	Do.	Do.	Do.
	5	—	Do.	3/5¾	3/5¾
	6	Quiet; Liverpool steady, no quotation	Do.	Do.	Do.

Steamer Freights.—(January 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, medium size, Jan.-Feb., 30s. per ton (9⅗d. per bushel), March, 28s. per ton (9⅒d. per bushel); to South Africa, 26s. 3d. to 27s. 6d. per ton (8⅖d. to 8$\frac{9}{10}$d. per bushel), prompt or new season. Parcels, Port Adelaide to London-Liverpool, or Continent, 30s. per ton (9⅗d. per bushel); Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel); to Sydney, 10s. 6d. per ton (3¼d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 28s. 9d. to 30s. per ton (9⅕d. to 9⅗d. per bushel), new crop; South Africa, 25s. to 26s. 3d. per ton (8d. to 8⅖d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on January 1st—

Butter.—The weather during December was, on the whole, very favorable for the forwarding of produce, as no long spells of heat were recorded. Values in top grades of butter firmed appreciably, best factory and creamery, fresh in prints, selling at from 1s. 1½d. to 1s. 2½d. per pound; choice separators and dairies, 10½d. to 1s.; stores and collectors', 7½d. to 8½d.

Eggs.—The quantities arriving still continue heavy and prices rule a little easier, hen being 8d. per dozen; duck, 9d.

Cheese.—Very extensive business has been put through in this line, buyers operating freely for the Christmas demand, while the heavy figures also attracted heavy export orders. Present quotations—5d. to 5½d. per pound for large to loaf.

Bacon.—Values are a shade lower than the previous month, with good inquiry, hams as usual meeting with speedy quittance. Present rates—Best factory-cured sides, 10d. to 10½d. per pound; hams, 1s. to 1s. 1d.; well cut and cured farm middles and rolls, 7d. to 9d.; country hams, 8d. to 11d.

Honey.—Small lots of new season's take are now on the market, and all parcels coming to hand clearing. The present price for prime clear extracted is 3½d. per pound.

Almonds.—Last season's stock are practically finished, and the trade awaits the arrival of the new crop. Quotations—Brandis, 6d.; mixed softshells, 5½d.; hard shells, 3d.; kernels, 1s. 6d.

Live Poultry.—The month of December always brings heavy quantities of poultry for the Christmas festivities, and supplies this season far exceeded former years. However, demand was very good throughout and good prices were secured, especially for quality lots. Good table roosters brought 3s. 6d. to 4s. each; nice conditioned cockerels, 2s. to 2s. 6d.; hens, 1s. 4d. to 1s. 9d., a few coops of light sorts selling under; ducks, 1s. 6d. to 3s.; geese, 3s. 6d. to 5s.; pigeons, 5d.; turkeys, from 7d. to 1s. per pound live weight for fattening to good table birds, a couple of coops of very choice quality selling higher.

Potatoes and Onions.—There has been an active inquiry for potatoes, and the month ended with the relation between supply and demand sufficiently close to indicate that the Adelaide plains crops are approaching exhaustion, and prices have firmed a little. The early Gambier crops have been much benefited by recent rains, but this has delayed ripening to some extent, and in consequence deliveries during January may not be so heavy as usual. Onions—Although local crops have proved to be lighter than was expected, under the influence of forward quotations from elsewhere, prices have not quite held to the closing November level. Potatoes—New locals, £5 to £5 10s. per ton on rail Mile End; 4s. to 4s. 6d. per cwt. in the market. Onions—£8 to £9 per ton on rail Mile End; 7s. to 8s. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of December, 1913, and the average annual rainfall.

Station.	For Dec., 1913.	To end Dec., 1913.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.			
Oodnadatta	0·34	6·12	4·76
Tarcoola	0·63	8·78	7·58
Hergott	0·44	6·18	6·04
Farina	0·30	6·15	6·70
Leigh's Creek	0·51	6·88	8·66
Beltana	0·73	5·49	9·22
Blinman	1·00	7·66	12·85
Hookina	0·55	8·02	—
Hawker	0·79	8·51	12·22
Wilson	0·86	8·74	11·78
Gordon	0·40	7·21	10·26
Quorn	0·96	8·59	13·78
Port Augusta	0·91	6·85	9·46
Port Augusta W.	0·87	6·92	9·36
Bruce	0·63	7·47	10·01
Hammond	0·74	8·32	11·46
Wilmington	0·89	12·66	18·26
Willowie	0·41	6·97	11·90
Melrose	0·89	15·02	23·04
Booleroo Centre	0·73	8·70	15·83
Port Germein	0·40	8·86	12·84
Wirrabara	0·78	15·98	18·91
Appila	0·76	9·61	15·08
Cradock	1·01	9·02	10·86
Carrieton	1·03	8·66	12·22
Johnburg	0·65	8·01	10·21
Eurelia	0·83	7·82	13·24
Orroroo	0·52	8·74	13·42
Black Rock	0·38	8·35	12·25
Petersburg	0·67	9·88	13·07
Yongala	0·71	9·19	13·94
NORTH-EAST.			
Ucolta	0·57	6·69	—
Nackara	—	7·30	—
Yunta	1·40	8·29	8·22
Waukaringa	1·30	7·81	7·94
Mannahill	0·73	9·96	8·46
Cockburn	0·63	5·08	7·97
Broken Hill, NSW	0·60	5·29	9·62
LOWER NORTH.			
Port Pirie	0·63	9·79	13·21
Port Broughton	0·48	11·13	14·33
Bute	0·35	14·17	15·42
Laura	0·72	14·09	18·22
Caltowie	0·65	13·53	17·27
Jamestown	0·89	14·27	17·46
Gladstone	0·48	12·90	16·00
Crystal Brook	0·84	12·34	15·62
Georgetown	0·61	15·88	18·32
Narridy	0·60	10·29	16·79
Redhill	0·56	12·40	16·79
Spalding	0·82	15·53	20·25
LOWER NORTH—*continued.*			
Gulnare	0·59	13·47	19·74
Bundaleer W. Wks.	0·57	12·97	17·29
Yacka	0·67	11·74	15·27
Koolunga	0·60	11·43	15·94
Snowtown	0·60	11·28	15·70
Brinkworth	0·58	14·34	15·48
Blyth	0·55	14·12	16·34
Clare	0·84	21·85	24·30
Mintaro Central	0·55	16·98	21·99
Watervale	1·00	25·09	27·17
Auburn	0·99	18·50	24·25
Hoyleton	1·54	13·88	17·96
Balaklava	0·56	11·16	16·03
Port Wakefield	0·55	10·30	13·13
Terowie	0·77	9·41	13·71
Yarcowie	0·62	11·80	13·91
Hallett	0·92	13·76	16·40
Mount Bryan	0·95	15·72	15·73
Burra	0·85	14·59	17·82
Farrell's Flat	0·54	14·19	18·87
WEST OF MURRAY RANGE.			
Manoora	0·59	14·97	18·09
Saddleworth	0·80	16·86	19·69
Marrabel	0·60	15·03	18·94
Riverton	1·07	17·58	20·48
Tarlee	0·80	16·16	17·48
Stockport	1·10	17·54	15·89
Hamley Bridge	1·08	16·27	16·45
Kapunda	1·16	19·65	19·67
Freeling	0·91	20·59	17·85
Greenock	0·99	20·98	21·46
Truro	0·74	24·34	19·74
Stockwell	0·89	18·71	20·30
Nuriootpa	0·70	17·12	21·25
Angaston	0·70	22·05	22·25
Tanunda	1·24	13·72	22·28
Lyndoch	1·02	20·10	23·01
ADELAIDE PLAINS.			
Mallala	0·94	15·36	16·88
Roseworthy	0·89	15·59	17·31
Gawler	0·97	16·59	19·21
Two Wells	1·50	13·15	16·36
Virginia	1·58	14·40	17·58
Smithfield	1·55	16·60	17·30
Salisbury	1·47	16·54	18·57
North Adelaide	2·45	20·42	21·49
Adelaide	2·47	18·19	21·04
Brighton	1·48	17·03	19·93
Glenelg	1·36	15·77	18·35
Magill	1·76	19·30	25·69
Glen Osmond	2·24	22·31	25·20
Mitcham	2·20	20·46	23·47
Belair	2·79	23·62	28·64

RAINFALL—*continued.*

Station.	For Dec., 1913.	To end Dec., 1913.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.			
Houghton	—	—	—
Teatree Gully	1·68	20·85	28·19
Stirling West	2·55	35·89	46·70
Uraidla	1·93	32·15	44·35
Clarendon	2·57	25·13	33·67
Morphett Vale	1·85	18·02	23·32
Noarlunga	1·46	15·22	20·28
Willunga	1·90	21·74	25·98
Aldinga	1·45	17·11	20·34
Normanville	0·73	15·72	20·65
Yankalilla	0·85	19·61	22·78
Cape Jervis	1·00	12·72	16·34
Mount Pleasant	1·04	23·74	26·87
Blumberg	1·23	20·59	29·38
Gumeracha	1·73	27·66	33·30
Lobethal	1·60	26·19	35·38
Woodside	1·53	26·25	31·87
Hahndorf	1·94	29·09	35·45
Nairne	1·84	22·38	28·83
Mount Barker	1·83	27·06	30·93
Echunga	1·93	27·64	32·83
Macclesfield	2·03	27·11	30·72
Meadows	2·10	30·86	35·52
Strathalbyn	2·30	21·12	19·28
MURRAY FLATS AND VALLEY.			
Wellington	0·85	14·03	15·01
Milang	1·84	11·86	16·08
Langhorne's Bdge	1·05	12·76	15·27
Tailem Bend	0·90	13·82	—
Murray Bridge	0·88	17·26	14·32
Callington	0·95	14·67	15·65
Mannum	0·44	10·57	11·67
Palmer	0·45	15·23	15·60
Sedan	0·33	13·80	11·92
Blanchetown	0·53	7·76	10·71
Eudunda	0·71	17·39	17·33
Sutherlands	0·50	10·58	10·60
Morgan	0·50	7·06	9·29
Overland Corner	0·65	11·78	11·42
Renmark	0·65	11·97	10·93
Loxton	0·65	—	—
WEST OF SPENCER'S GULF.			
Eucla	0·07	6·56	10·13
White Well	0·17	6·82	9·67
Fowler's Bay	0·69	10·74	12·11
Penong	1·32	10·31	11·93
Murat Bay	0·96	10·62	—
Smoky Bay	0·68	11·66	—
Streaky Bay	1·23	12·03	15·31
Port Elliston	1·58	10·62	16·49
WEST OF SPENCER'S GULF—*continued.*			
Port Lincoln	1·09	13·26	19·88
Tumby	1·28	12·18	15·00
Carrow	1·12	11·61	—
Cowell	0·94	9·98	11·76
Point Lowly	0·58	7·71	12·21
YORKE'S PENINSULA.			
Wallaroo	1·28	14·96	14·05
Kadina	1·29	13·96	15·88
Moonta	0·96	13·96	15·22
Green's Plains	0·98	12·94	15·73
Maitland	0·82	15·14	20·08
Ardrossan	0·93	14·04	13·89
Port Victoria	0·78	12·62	15·20
Curramulka	0·72	14·83	18·51
Minlaton	0·66	13·39	17·41
Stansbury	0·56	14·32	17·06
Warooka	0·76	13·13	17·71
Yorketown	0·82	13·11	17·47
Edithburgh	0·76	14·87	16·48
SOUTH AND SOUTH-EAST.			
Cape Borda	1·04	18·29	25·09
Kingscote	1·15	15·59	18·95
Penneshaw	1·13	16·25	21·34
Cape Willoughby	0·77	18·04	19·69
Victor Harbor	1·63	16·13	22·18
Port Elliot	1·44	15·39	20·33
Goolwa	1·67	15·11	17·93
Pinnaroo	0·57	13·50	16·74
Parilla	0·54	13·42	—
Lameroo	0·78	17·86	16·55
Parrakie	0·79	12·56	—
Geranium	0·80	15·48	—
Peake	1·01	15·60	—
Cooke's Plains	1·04	14·45	14·74
Meningie	1·43	15·69	18·87
Coonalpyn	0·70	17·20	17·49
Tintinara	1·10	15·23	18·78
Keith	1·14	18·98	—
Bordertown	0·73	18·02	19·76
Wolseley	0·63	17·15	17·72
Frances	1·02	16·87	20·74
Naracoorte	1·85	19·81	22·60
Penola	1·98	19·56	26·78
Lucindale	1·74	17·14	23·32
Kingston	1·96	19·42	24·73
Robe	1·50	18·52	24·69
Beachport	2·31	22·67	27·51
Millicent	2·78	26·52	29·25
Mount Gambier	2·71	26·30	32·00
C. Nrthumberland	2·29	20·35	26·63

AGRICULTURAL BUREAU REPORTS.

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Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Feb.	March.			Feb.	March.
Amyton	*	—	—	Greenock	*	—	—
Angaston	*	7	7	Green Patch	*	—	—
Appila-Yarrowie	*	—	—	Gumeracha	*	10	10
Arden Vale & Wyacca	*	—	—	Hartley	691	11	11
Arthurton	*	—	—	Hawker	*	9	9
Balaklava	*	—	—	Hookina	681	10	10
Bandon	*	—	—	Inman Valley	691	—	—
Beetaloo Valley	*	—	—	Ironbank	§	6	6
Belalie North	*	7	7	Julia	*	—	—
Berri	§	14	14	Kadina	*	10	10
Blackwood	689	12	12	Kalangadoo	*	14	14
Blyth	686	21	21	Kanmantoo	694	7	7
Booleroo Centre	*	—	—	Keith	694	14	14
Borrika	*	—	—	Kingscote	*	6	6
Bowhill	*	—	—	Koppio	687	—	—
Burra	682	6	6	Kybybolite	694	5	12
Bute	*	—	—	Lameroo	688	—	—
Butler	*	—	—	Leighton	*	—	—
Caltowie	*	7	7	Lipson	*	—	—
Canowie Belt	682	—	—	Longwood	692	11	11
Carrieton	*	5	12	Loxton	*	—	—
Cherry Gardens	691, 693	10	10	Lucindale	*	—	—
Clanfield	*	—	—	Lyndoch	686	5	5
Clare	684	6	6	MacGillivray	*	—	—
Clarendon	*	9	9	Maitland	*	8	8
Claypan Bore	*	—	—	Mallala	*	5	5
Colton	*	14	14	Mangalo	*	—	—
Coomandook	*	—	—	Mannum	*	28	28
Coomooroo	*	—	—	Meadows	694	10	10
Coonalpyn	‡	—	—	Meningie	691	14	14
Coonawarra	*	—	—	Millicent	695	13	13
Coorabie	688	—	—	Miltalie	688	7	7
Cradock	*	—	—	Minlaton	686	5	12
Crystal Brook	‡	—	—	Mitchell	*	14	14
Davenport	*	—	—	Monarto South	688	—	—
Dawson	682	—	—	Monteith	*	—	—
Dingabledinga	*	—	—	Moonta	*	—	—
Dowlingville	*	—	—	Moorlands	*	—	—
Elbow Hill	*	—	—	Morchard	682	—	—
Forest Range	*	5	12	Morgan	†	—	—
Forster	*	—	—	Morphett Vale	*	—	—
Frances	*	6	6	Mount Barker	694	11	11
Freeling	*	—	—	Mount Bryan	*	7	7
Friedrichswalde	‡	—	—	Mount Bryan East	‡	7	7
Gawler River	*	—	—	Mount Gambier	*	—	—
Georgetown	*	7	7	Mount Pleasant	692	9	9
Geranium	*	28	28	Mount Remarkable	*	11	11
Gladstone	*	—	—	Mundoora	*	—	—
Glencoe	696	—	—	Myponga	692	—	—
Goode	688	—	—	McNamara Bore	*	—	—

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		Feb.	March.			Feb.	March.
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Naracoorte	695	14	14	Spalding	*	—	—
Narridy	*	—	—	Stockport	*	—	—
Narrung	693	—	—	Strathalbyn	693	—	—
North Booborowie	*	—	—	Sutherlands	689	7	7
North Bundaleer	‡	—	—	Tarcowie	*	10	10
Northfield	*	3	3	Tatiara	*	7	7
Orroroo	*	—	—	Tintinara	*	—	—
Parilla	688	—	—	Two Wells	*	—	—
Parilla Well	*	—	—	Uraidla and Summert'n	693	—	—
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Penong	*	14	14	Watervale	‡	—	—
Petina	*	—	—	Wepowie	681	—	—
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Port Pirie	*	—	—	Wirrabara	682	14	—
Quorn	*	—	—	Wirrega	696	—	—
Redhill	*	10	10	Woodside	*	—	—
Renmark	*	—	—	Wynarka	‡	—	—
Riverton	*	—	—	Yabmana	*	—	—
Roberts and Verran	*	—	—	Yadnarie	†	—	—
Saddleworth	*	20	20	Yallunda	*	—	—
Salisbury	685	3	3	Yongala Vale	*	14	14
Shannon	*	—	—	Yorketown	‡	—	—

* No report received during the month of December. † Formal report only received. ‡ Held over.
§ Omitted owing to pressure on space

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ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

February 11th and March 11th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

HOOKINA (Average annual rainfall, 12in.)

December 9th.—Present: seven members.

Hay-Making.—Mr. S. Stone read a paper as follows:—"Where large quantities of crop have to be cut with one machine it is advisable to commence as soon as the wheat is in flower. This will give the grower a chance to finish before portion of the crop becomes too ripe. If some of the sheaves are dry and some a bit green it will make a good sample of chaff when mixed. Another way of working the crop at the most opportune time is to sow both early and late samples, so that by the time the early varieties are finished the late will be ready for the binder. King's Early, Fill-the-Bag, and Bluey can be worked in this way, and are also excellent wheats for hay. The binder is by far the most economic and labor-saving machine to deal with large quantities of crop. It is a good plan to leave sheaves on the ground for a day after being cut before stooking. They will then be ready to go into the stack much sooner than if stooked immediately. The sheaves will also keep a better shape. Sometimes when they are stooked green a heavy wind will twist them and make stack-building difficult. About a dozen sheaves will be sufficient for one stook. When stack-building keep the outside sheaves as level as possible, especially where short sheaves have to be dealt with. There will then be little chance of the stack slipping. The centre should be kept higher than the outside." Members agreed with the paper generally, but were of the opinion that methods were dependent on prevailing climatic conditions. Farmers would need to use their judgment as to the best time to stook and stack hay.

WEPOWIE (Average annual rainfall, 13in. to 14in.).

November 19th.—Present: 14 members and three visitors.

Horse-Breeding.—Mr. J. Orrock contributed a paper on this subject in which he stated that many farmers favored the so termed "mongrel" horses in preference to the well-bred draught. The former were generally less costly and more lively and active, and would thrive better than the latter. In districts where the soil was sandy a light team was more serviceable. For breeding he would select a mare that was staunch, shapely, quiet, and free from blemishes such as ringbone, stringhalt, or splints. She should have a roomy frame, with hips sloping somewhat, be a little above average length, wide chested, deep in the girth, and possess strong quarters. The animal should be in good condition prior to being put to the horse. He believed in steady, constant, and light work to within a few days of foaling. During gestation the mare should be carefully treated, and not overfed with rich food. This, and excitement, often caused abortion. He preferred the Clydesdale type for use in this district, as strong and active horses were needed to work the heavy soil.

WILMINGTON (Average annual rainfall, 18·16in.)

December 10th.—Present: 14 members.

Co-operative Marketing of Produce.—Mr. G. Shuppan contributed a paper on this subject, in which he stated that it was necessary, in order that they might receive the full value of their produce, for producers to co-operate in selling. One difficulty in connection with the application of this system to the wheat harvest was that the majority of farmers would not feel disposed to wait for payment until returns were secured from the oversea markets.

WIRRABARA (Average annual rainfall, 18·91in.)

December 13th.—Present: 13 members.

Marketing Orchard Produce.—The Hon. Secretary (Mr. A. R. Woodlands) read a paper. First quality fruit only, he said, should be marketed fresh. Second grade stuff should be dried, canned, or manufactured into jam. Co-operative jam factories were recommended. Every grower in a large way should export portion of his crop of pears and apples each year in order that prices in the local market should be kept at a remunerative figure. Co-operative packing for export had proved an absolute success in Victoria, and it might with advantage be tried in this district. The use of the standard case should be enforced. Members agreed that there was a much more ready sale for first quality than second quality fruit. Co-operative packing sheds were favored.

DAWSON, November 9th.—**Exhibits.**—The Chairman (Mr. J. Thomas) tabled samples of lucerne. One cut from a manured plot showed splendid growth, and was at least 6in. higher than a crop on unmanured land.

Crop Reports.—It was reported that the crops in this district would probably be very light owing to the scanty rainfall. Those on stubble ground would not be worth reaping. There were good crops, however, nearer Hallett and Mount Bryan.

MORCHARD, November 15th.—**Summer Fallowing.**—Mr. R. Kitto contributed a paper on this subject. He advocated burning the stubble, then working the land with a spring cultivator. It would then be found that after seeding there was a good crop of rubbish on the land, and it could be worked in the opposite direction. Another cultivating should follow in the spring, and the harrows should cross the cultivating after every rain.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

BURRA (Average annual rainfall, 17·82in.).

November 14th.—Present: four members.

Hay-Making.—Mr. H. Cullen contributed a paper. Wheat sown for hay, he said, should be of an early variety. It was necessary to exercise every care in stooking the early-cut hay, as it was very liable to sweat. When stooking close behind the binder the stooks should be made long, and not more than five sheaves wide; in cool weather four sheaves was sufficiently wide. Carting should not be commenced until the hay had been a fortnight in the field. A stack that was only to stand for a month or two did not need such careful building as one that was required to last for an indefinite period. The latter should be carefully batted, and the centre should be kept higher than the sides whilst it was being built.

CANOWIE BELT (Average annual rainfall, 20·04in.).

November 13th.—Present: 18 members and one visitor.

Farm Management.—Mr. C. O'Mahony read a paper under this heading. Stables should be divided into 5ft. stalls. Working horses should be cleaned in the morning and at midday. Buildings should not be put too close together, as there was then less damage in the event of fire. If the paddocks were left unworked within 3ft. of the fences, the latter would be less frequently damaged, especially where iron standards and droppers were used. In throwing out the furrow when fallowing it was a mistake to work the same way each year.

Hay-Harvesting.—Mr. A. Noll read a paper. The more evenly the binder was worked, he said, the better the results. The reel should not be worked too low on to the knife. The sheaves should be tied about one-third from the butt end. The hay should be left for a day or two after mowing. It could then be put into upright stooks, not too large. He would commence carting three weeks or a month after cutting, the operations being performed as quickly as possible. The stack should be gradually sprung out to the eaves, the centre being kept higher than the sides. Thatching should be done immediately after harvest.

WHYTE-YARCOWIE (Average annual rainfall, 13·91in.)

November 17th.—Present: nine members.

Stock-Carrying Capacity of a Northern Farm.—The Chairman (Mr. G. F. Jenkins) read a paper, from which the following is extracted:—"The number of stock carried on the Roseworthy College Farm has been an eye-opener to many people, particularly as the land cannot be considered by any means high-class grazing country. Most of the grain crops there are cut with the binder and threshed. While this lessens the carrying capacity of the stubble lands there is a large amount of fodder in the shape of cocky chaff and broken straw saved, which is used to tide the sheep over hard times, thus enabling more stock to be carried than when the grain is reaped with the harvester. Of course, a great deal of the stubble and cocky chaff left is eaten by the stock, but the first heavy rain that falls spoils practically all the cocky chaff and lessens the feeding value of the stubble also. Hence my opinion—more stock could be carried on our farms if we used the binder and thresher and saved the straw and cocky chaff for fodder. The addition of a little molasses would make this very palatable to sheep in times of scarcity, and would often enable us to sell our surplus stock to better advantage than we do at present. During the month of September the fallows at Roseworthy carry half a sheep to the acre, and during September and October approximately one sheep to the acre is carried. Here the average farmer has the whole of his fallow land cultivated and in a clean state by the end of October, and the best that can be looked for is for our fallows to carry about one sheep to the acre for one month only, with an occasional day through the summer months. In this district, on a 900-acre farm, a farmer who follows a three years' rotation, *i.e.*, fallow, crop, and graze, without the growth of fodder crops, can keep a flock of about 200 ewes. Given an 85 per cent. lambing this would mean that for about six months of the year, say from April to the end of October, he would have 370 sheep grazing on his land. Of course, one cannot lay down any hard and fast rule, as in good seasons many more sheep can be safely carried, and under such conditions store sheep can be bought and fattened and sold at a good profit; but in seasons when feed is not over-plentiful he will find that 200 ewes are enough. I have followed the practice of feeding off my crop every year since I have been farming on my own account, and I am convinced that it has paid me to do so. This year particularly, when the crops came up so unevenly, the sheep were turned in about the second week in August and had a fortnight of really good feed just at a time when the ewes were beginning to suffer and the lambs were going off. The result was that the ewes were given a really good filling up and a good flow of milk, much to the advantage of the lambs, which I would have had difficulty in getting into freezer condition had I kept them on the pasture land. Taking the sheep off the ordinary pasture at that time allowed the feed to get a good start, and so the ewes went out of the wheat into a good paddock, and the lambs went right ahead in condition. I feel sure, too, that the crop benefited from the feeding off, as it gave the later wheat a chance to come up to that which started early. I noticed also that the plants which were eaten off stooled out better and made stronger growth afterwards. I consider that not only did the crop save the flock, but the flock, by feeding off, helped the crop considerably.

"*Fodder Crops.*—The growth of fodder crops has not been tried to any great extent in this district. There are natural conditions which interfere very considerably with the growth of many fodders which can be profitably grown elsewhere. These highlands are subject to such severe frosts during the winter months that it is only under very favorable conditions, such as those given by good early autumn rains, that we can hope to grow such a crop as rape to any advantage. Once the winter frosts set in such crops will make little headway unless they are already firmly established in the soil. If we were to sow 5lbs. to 6lbs. of lucerne to the acre in our cereal crops we would be following a losing proposition, considering the high price of lucerne seed. The present value of this is about 1s. 6d. per pound, and if we sow 5lbs. or 6lbs. per acre that means from 7s. 6d. to 9s. per acre for seed alone. I am very doubtful if the additional feed grown would compensate for such a heavy outlay. Again, the heavy frosts of our winter months would kill much of the young lucerne. Having regard to this fodder, I should say that the Roseworthy experiment of sowing lucerne with the cereal or hay crops did not pay for the cost of seed. Professor Perkins stated that it is only in about one season in three that a good stand of lucerne can be expected, and if we go to the expense of sowing 5lbs. or 6lbs. of seed to the acre each year for one crop in three I do not think such would be a profitable investment. In the Roseworthy experiments the average grazing capacity of lucerne sown in this way was only 1·35 sheep per acre, which is apparently little if any better than the ordinary pasture. In considering the grazing capacity of our farms we must not lose sight of the fact that in this district it is a general practice to turn all working horses out to pasture as soon as fallowing is completed, and they are usually worked on such feed during the spring months, that is from September to December, say three months. In addition all the young and idle horses have to get a living during the greater part of the year on the grass and stubble lands. A farmer with 900 acres would need about 16 head of horses, equal to over 100 sheep; besides which there is the dairy herd to be carried. The man who stocks carefully has always fat sheep to sell, and is not obliged to get rid of his fat stock when the market is glutted, but can hold and market such to the best advantage. He can take advantage of a temporary slump in prices to buy, and can sell when prices have recovered. If he rears fat lambs, and I think there is no better paying proposition for the farmer, he can market his lambs early and secure top prices, while his less fortunate neighbor who stocks heavily will have to hold until prices have dropped considerably. I believe, with the Professor, that more stock can be carried in small paddocks than in large ones, but they must, through the summer months at any rate, have a plentiful supply of drinking water in the paddocks. The farmer who drives his sheep to water suffers in many ways. First there is the time lost in doing so; secondly, the sheep never thrive so well as when they can drink when they will; and again, the dirt raised in driving the flock to water considerably lowers the selling value of his wool. In conclusion, let me say that I think every farmer who keeps sheep should conduct some experiments with fodder crops. I do not mean that he should attempt to grow any particular kind of fodder on a large scale, but should experiment with one or more fodder plants each year on a small piece of land in the hope that he will be successful with some of them, because there is no question that the meat industry is going to be a more sure and paying proposition in the future than in the past." Mr. Hunt had tried lucerne and other fodders, but had not been successful with them, and agreed with the writer that in the long run, all things considered, the growing of fodder or catch crops was a losing proposition in this district. Mr. Lock recommended members to try some of the more drought-resisting native shrubs and fodders. Lucerne with irrigation would be a success, but without the water he was very doubtful of the result. Mr. G. D. Mudge had not been successful in his attempts to grow lucerne with the wheat crop, but was trying it alone with more promise of success. Mr. Robinson considered there was nothing to equal lucerne where it could be grown. He gave an instance, from another district (Mannanarie), where they had sown the seed with the wheat crop. Heavy rains followed the cutting of the wheat, and the lucerne did well and provided good fodder for several years.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

CLARE (Average annual rainfall, 24·30in.).

November 14th.—Present: 20 members and two visitors.

Hay Making and Stacking.—Mr. C. Neate read a paper. He said—" Land intended for hay-growing should be well worked and sown at the rate of 1½bush. of wheat and 2cwts. of super. to the acre; or, if oats are sown, 2bush. and 2cwts. of super. should be used. On a small plot it is a very good plan to drill in 1bush. wheat and 1cwt. super. to the acre, and cross drill 1½bush. of oats with 1cwt. manure. In such case a late wheat is necessary, otherwise the wheat will be too ripe by the time the oats are ready to cut. Good hay wheats for this district are Majestic, Neumann's Early, Baroota Wonder, King's Early, Yandilla King, and Marshall's No. 3, in the order named. These varieties, while making good growth, retain a nice green color, and make very heavy hay. The time to cut hay depends a good deal on whether it is intended for home use or for market. If for the former, leave it till the grain has reached the dough stage; the grain being full and soft, and the lower stalk and flag losing color; but if for market, it should be cut when the grain is in the milk stage, to get that nice green color which is the ruling factor in the hay markets Oats should not be cut until they begin to turn from green to purple, or they will be bitter. Use only the best twine. The sheaves should be tied as tight as possible; they will always shrink as the hay dries. Hay stooked as soon after cutting as possible has a better color than if left to lie on the ground for a day or two. The stooks should be round, and the sheaves placed well together. The hay should be left in the stooks at least 12 or 14 days before it is stacked. Do not make the stack too wide; from 15ft. to 18ft. is quite enough Keep the centre at least a foot higher than the outside, with an even slope from the centre to the outside walls. Build with the fork, and place the outside sheaves slightly on edge; this will prevent them slipping. Place the rest of the rows with the head out, and give them plenty of lap. See that every sheaf is placed, and have the centre of the stack firm and solid. The last two layers when the eaves are reached should project at least 6in. or 8in. I do not favor the method of building the outside rows with the hand and kneeling on them and filling the centre loosely with the fork, for the reason that when the stack settles, the outside, being built more solidly, does not settle to the same extent as the centre. Therefore, instead of the sheaves having a dip outward, they dip towards the centre, carrying the water into the stack instead of out. If it is intended to thatch the stack—and all stacks should be thatched—roof with the butts out, but if it is to stand for a time without thatching, roof with the heads out. By placing the heads out and using ordinary care in building, very little, if any, water will get into the stack. If one only cuts enough hay for his own use every year, a hay shed will undoubtedly prove a good investment." Mr. F. Pink agreed that it was advisable to stook hay as soon as possible after it was cut. Mr. I. C. Radford considered it best to cut when it was in the flowering stage when required for home use, and add grain to it if necessary when feeding to horses. The animals relished the hay more. If cutting hay for market he would allow it to ripen, then it would weigh more. Mr. Scales thought King's Early the best variety to grow for hay in this district. Mr. Pattullo considered the best time to cut wheat for hay was when the grain was in the milky stage. In replying, Mr. Neate said that King's Early seemed to be the favorite in this district, but he advised farmers to try Majestic.

SALISBURY (Average annual rainfall, 18·57in.)

December 4th.—Present: seven members.

Poultry on the Farm.—Mr. W. R. Day read a paper on "Egg-production," from which the following has been extracted:—"A few years ago special inducements for poultry-keeping were to be found in the low price of grain and other foods. This had the effect of causing a number of people to start in the industry, but with a rise in the price of wheat, &c., at about that time the majority of them gave up the business. When we had the cheaper foods, however, we had the lesser price for our eggs in the open market, and simultaneously with the higher price of all foods during the last few years the market value of the egg has also advanced, until last year we obtained an average weekly market value of 1s. 1·06d. per dozen. The industry was never on a better footing than it is at present. In South Australia we have a good climate and are within easy distance of good markets, either for local consumption or for export. The latter can easily be arranged through the Government Produce Depôt at Port Adelaide, which is no doubt responsible to a large extent for the upward tendency in prices during recent years. One advantage gained by the producer through the export business is that he receives payment on the per grade system. Eggs should be sold by weight, as this would tend to the production of a better sample, and consequently better returns. A good laying strain of the White Leghorn appears to be able to give a fair return for the capital expended. The choice of bird or birds has been the stumbling block to a good many in the past, for it is upon the ability of the poultry man to select and maintain the laying strain that success depends. I consider it is quite possible for the farmer to keep a flock of fowls for the sum of one penny per head per week, or approximately 4s. per head per year. A flock under ordinary conditions should produce an average of 144 eggs per hen per year, and these at 8d. per dozen will give him 100 per cent. profit over the cost of feed. I feel sure if farmers were to keep the right sort or class, keep an eye on them generally, and cull out occasionally to keep them within the age limit, and yard them away from the mangers, haystacks, and implements, they would soon learn to look upon them as a much more desirable asset than at present."

At a previous meeting Mr. Bagster gave a demonstration of rope splicing and knotting, which was of much interest to members

BLYTH, November 15th.—LAND SETTLEMENT.—Mr. T. Dunstan read a paper under this heading. He drew attention to the difficulties in the way of the person who was without much capital securing land in this State before the introduction of the present system under which the Government supplied land, the payment being extended over long periods. He advised young men intending to take up land to secure it under the more liberal conditions now prevailing.

LYNDOCH, November 13th.—HAY.—Mr. H. Springbett tabled a sheaf of hay consisting of White Tuscan wheat and New Zealand Cape oats, about 5ft. 6in. in height. The sample was clean and free of rust, and the seeding had consisted of three parts of wheat to one part of oats.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

MINLATON (Average annual rainfall, 17·46in.).

November 13th.—Present: 13 members and one visitor.

PREPARATION OF SEED.—Mr. Ewens contributed a paper under this heading in which he said it was advisable to purchase grain for seed from a reputable farmer or seedsman. A change of seed from another district was often of advantage. He would rewinnow and grade all seed wheat so purchased. Grain reaped while still a little green should not be used for seed, and no amount of labor would make smutty, dirty, or mixed grain suitable. The importance of grading could not be over estimated. There was no doubt that the plumpest grain produced the strongest plant, in spite of the fact that rusty and small seed had produced good crops. He would do all cleaning and grading as soon as practicable after harvest. The seed should be placed in new bags turned inside out, which would enable the farmer to mark the bags without spoiling them for future use. They should be stacked end on end in a dry place to avoid damage by mice. He would pickle only sufficient grain to furnish seed for the following year. He preferred seed which he had produced himself. Members generally agreed with the ideas expressed by the writer of the paper.

PINE FOREST (Average annual rainfall, 14·15in.).

November 17th.—Present: eight members.

HANDLING WHEAT IN BULK.—Mr. H. Dolling read a paper, from which the following is taken:—"The main argument in favor of the system of bulk handling is the saving of the cost of bags. Under the method of harvesting adopted here, it is impracticable to dispense with the bag on the farm. It is patent to any farmer that about 60 per cent. of bags would be required to take off a crop; more would be required if good harvesting weather were experienced. Of course all bags would be used until they were worn out. The life of the bag could be fairly put down at two years, showing a saving of 50 per cent., that is if wheat in bulk would sell at the same price on the London markets as wheat in bags. So far I find that such is not the case. The section of the Chamber of Commerce which deals with the grain trade disagrees with the report of the Wheat Commission. Upon the alleged saving of bags in the bulk system it furnished some statements worthy of consideration, for the expectation of being relieved of the cost of bags had much to do with the favorable evidence collected by the Commission. Bagged wheat brings 3s. per quarter more in London than bulk wheat. An extra 2s. 6d. per ton freight, and 1¼ per cent. insurance would be incurred, thus absorbing the amount saved in bags. If these statements are correct (and the Commission furnishes no evidence to the contrary) there would be no saving in the item of bags, and nothing to compensate for the cost of the elevators. Upon the surface is a fair inference that a system which is adopted in such advanced countries as the United States and Canada would be an improvement in Australia, and this was the attitude of mind with the present writer when on two occasions he investigated the system in the countries referred to. It was disappointing to meet with evidence which necessitated a verdict against the desirableness of adopting the American system. On the first investigation it was found that although the Pacific coast had been exporting wheat for more than a generation, every bushel had been sent away in small bags. Further, that the elevator or bulk system was unquestionably economical, and the best for the Atlantic trade, while the best and most economical system for the Pacific was to use the bag. The second investigation confirmed these conclusions. It was found that the introduction of the bulk system had nothing to do with the saving of bags, but had been developed as a means of reducing the cost of handling grain when frequent handling of large quantities was necessary. Take, for example, the extreme case of farm to railway, from railway to lake boat, from lake boat to railway, from railway to ocean liner. A bag of wheat could not pay its way on such a journey of transhipment, and the bulk system was evolved as a means of rendering the transportation practicable. While Atlantic shipping arrangements were organised to suit it, no such frequent handlings were necessary on the Pacific slopes, and consequently the bulk system was not necessary. If there had been anything to gain the wheatgrowers of California would have gone after it as promptly as those shipping in the opposite direction. If under the elevator system 25 per cent. of wheat has to be bagged for shipping purposes, with the 50 per cent. needed on the farm and the lower price for wheat, there would be a loss to the State on the bag item for a start. Of course half of the 25 per cent. has to be deducted from the 50 per cent., making the amount of bags needed 62 per cent., not including home requirements or seed wheat. So far I have dealt with wheat for export. Wheat for home consumption must also be taken into consideration. If the miller gets his wheat without a bag, he will have to buy bags for his flour, bran, pollard, &c. He will then either give less for wheat or charge more for flour. There would be no saving in bags, anyhow. Advocates of the bulk system say that a cleaner wheat would be shipped, and consequently a better price would be obtained. I admit that South Australian wheat is not as clean as it should be. What with covering the screens, or allowing them to become choked, sowing wheat mixed with barley, and growing smut, it is no wonder there is some rubbish in our wheat. But why erect costly machinery to clean it when we have the machinery on the farm now? Sow clean seed well pickled, give the harvester or motor winnower fair play, then a sample of wheat will be obtained that will need no more cleaning. The cost of handling wheat under the present system is not great. If it is shipped direct from wagon to truck, from truck to ship, the cost is one-third of a penny per bushel; if into stack, then truck to ship, ½d. per bushel. These figures are approximate. I do not think it is possible to handle wheat more cheaply under the elevator system, because our vast coastline and the small quantity of wheat to be handled are against the system being worked economically." Mr. Edwards thought a better price would be secured in the English markets for a cleaner sample marketed under the bulk handling system, but Mr. Adams thought it unfair that the farmer who produced a good sample should have to assist in erecting elevators and machinery to clean the wheat of the indifferent wheatgrower. Messrs. A. Hewett and R. Barr thought it unwise to erect elevators at present, and a motion to this effect was carried by the Branch.

WESTERN DISTRICT.

KOPPIO (Average annual rainfall, 22·40in.).

November 11th.—Present: 10 members.

Harvesting.—Mr. J. Newell contributed a paper on this subject. He preferred oaten to wheaten hay for horses, the favored varieties being Algerian and Calcutta Cape. The oat crop should be cut just when the tops of the heads were beginning to brown off. The practice of mixing oats and wheat for sowing in this district was not advisable, as it was sometimes found more profitable to leave the crop for grain. The hay should be put into long, narrow stooks directly after the binder, stacking being commenced 12 days later. The centre of the stack should be kept slightly higher than the sides, the sheaves being put butts outward until roofing was commenced, when the heads should be placed outwards. Thatching grass would be found very useful, and with care would last for a number of years. Barley should not be stripped until it was quite ripe, as it was likely to heat and discolor. The most profitable way of harvesting oats was to cut and thresh them. The damp-weather stripper and winnower constituted the best method of handling the wheat crop, a small engine being very useful in conjunction with the latter machine. Wheat heaps should not be made in watercourses or in stony ground. A good marketable sample of grain should be produced. Mr. Gardener preferred wheaten to oaten hay, but a mixture was best. A small engine was of great assistance in winnowing and in other ways on the farm. Mr. T. Richardson thought wheaten hay preferable, especially if it were fed long.

MILTALIE (Average annual rainfall, 14·55in.).

November 8th.—Present: 10 members and four visitors.

Working Teams.—Mr. P. G. Wilson read a paper. He thought it unreasonable to expect eight horses to work evenly and smoothly abreast on one bar. The centre horses could do none of the work, and a fast horse could not be tied back. He preferred to work them in two lots of four, with equalisers. When there were long lands and the paddocks were free of stumps, it was a good practice to attach the horses to a perpendicular swing at the end of the long swing. Mr. J. S. Jacobs preferred working eight horses abreast, as the driver had more control over them, and they were nearer their work. Messrs. W. E. Heir, W. G. Smith, J. P. Storey, and M. D. Searle also took part in the discussion.

COORABIE, November 16th.—Prospects.—Members estimated that in the hundred of Scherk there was an increased area under crop over that of last year of 1,600 to 1,700 acres. Probably the yield would be 3bush. per acre. The area cut for hay showed a decrease of about 75 per cent. on last year's figures. The yield would probably be about 5cwts. per acre. In the hundred of Wookata the increased area under crop was estimated at 1,800 acres, and the average yield 3½bush. The area cut for hay was about the same as last year, the average yield being approximately 7cwts. per acre. It was recognised that these very unsatisfactory results were not only due to great shortage of rain during the winter months, but also in a very large measure to the exceptional gales of wind which visited the district almost continuously during the months of July and August, and which ruined numbers of promising crops, particularly on new scrub land.

GOODE, November 13th.—Homestead Meeting.—Members took the opportunity of inspecting the farm of Messrs. Will Bros. This constituted one of the best laid out farms in the district. The crops were well grown and consisted of Late Gluyas, King's Red, Thew, King's Early, Early Gluyas, Carmichael, Pratt's Comeback, and Alpha wheats. However, all were badly affected with rust. On the farm of Mr. C. Will, adjoining, manurial tests were being conducted, and members were much interested in these.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

LAMEROO (Average annual rainfall, 16·55in.).

November 22nd.—Present: 14 members and two visitors.

The Evolution of the Farmer.—An interesting paper under this heading was read by Mr. Mayo. He outlined briefly the growth of methods and appliances used at certain epochs of the world's history, and analysed the underlying causes which apparently had been responsible for the initiation and development of farming.

Wheat Crops.—Mention was made of the fact that in some cases the straw of the wheat was brittle and the chaff white, whilst the grain was still soft. Mr. E. J. Trowbridge attributed the trouble to the weather conditions, which had unduly forced the plants. Golden Drop and Walker's Wonder had suffered most. Mr. Jericho thought feeding down would be beneficial, but Mr. F. W. Eime had tried this without effect. Members generally considered the trouble due to the unusual season.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.)

December 13th.—Present: 14 members and two visitors.

Hay-Making.—Mr. A. Patterson read a paper. The best time to cut the crop for hay, he said, was just after the bloom had fallen. It should be immediately put into stooks four sheaves wide, in which it should be left for 15 or 20 days. If carted too soon it was liable to become mouldy in the stack. He strongly recommended the erection of hay sheds, as the hay first cut could then be carted in immediately it was ready. Hay from a good galvanized iron shed, also, was superior in quality to hay from a stack. In building stacks the centre should be kept well up and thatching should be done as soon as possible.

PARILLA (Average annual rainfall, 16in. to 17in.).

November 6th.—Present: 19 members and two visitors.

Harvester v. Stripper.—Mr. G. E. Gregory read a paper. He favored the stripper. With three of these machines in three years he had taken the crop off 2,000 acres. Repairs had cost about £1 per machine annually. The cocky chaff mixed with molasses and fed to working horses had saved £40 worth of hay during the year. The chaff could also with advantage be mixed with bran and fed to ewes rearing lambs.

Mr. P. Harrip also contributed a paper. He had used a harvester for three successive seasons, and thought it the best machine. It saved a good deal of labor. He did not think cocky chaff worth saving. An interesting discussion followed, in which Messrs. M. Shannon, J. H. Daniel, H. G. Johnston, Millsteed, Stevens, E. J. Kenley, J. Roachock, Neindorf, C. E. Moyle, P. W. Lewis, and Stevens took part. A vote was taken on the subject, and resulted in 11 members favoring the harvester and six the stripper.

PARRAKIE (Average annual rainfall, 16in. to 17in.)

November 8th.—Present: 10 members.

Marketing Wheat.—In a paper on this subject Mr. H. Diener said it was a good plan for the farmer to sell part of his wheat crop for forward delivery if a satisfactory price were obtainable. It was a mistake to store with the buyer. If a shed or barn were not available he could place it in the open on plenty of good dunnage and cover it with iron. The writer of the paper favored the erection of an elevator at the Outer Harbor. The f.a.q. system offered no inducement for the producer to clean his grain. He thought the f.a.q. standard should be fixed by an equal number of representatives of the buyers and sellers, with an independent chairman approved by the Government. It was a bad policy to buy bags for and pay freight on drake, cracked grain, &c., which could be more profitably utilised on the farm. The bulk-handling system would eliminate a number of the transport difficulties which were encountered at present. It would save time, labor, and cornsacks, and ensure a better price for the cleaned wheat. Mr. J. Temby favored immediate delivery to the railway siding. If held on the farm there was frequently difficulty in getting the grain to the railway when it was sold, and there was generally loss through mice and other vermin. Mr. Jose preferred to hold the wheat. Farmers should attend to their stubble and stump burning immediately after harvest, and cart the wheat later.

SUTHERLANDS (Average annual rainfall, 10·60in.).

November 8th.—Present: six members.

Care of Implements.—A short paper on this subject was read by Mr. J. B. Thiele. He stated that adequate shelter should be provided for all implements and machinery on the farm. Grease, oil, &c., should be immediately removed from harvesting machinery after the harvest was completed, and the machinery overhauled generally. Occasional coatings of paint were advisable. He preferred iron sheds to thatched, on account of there being less danger of fire and a very appreciable water catchment with the former. Mr. G. Geyer made a practice of placing a block of wood underneath the wheels of his harvesters, as he had found that in the event of sand being blown against the machines there was a probability of white ants causing damage. Mr. Twartz recommended supporting the comb with a prop in order to preserve its shape.

Handling Wheat in Bulk.—Mr. Thiele initiated a discussion on this subject. Members were of the opinion that the best policy to adopt in this connection would be for grain stores to be erected at shipping ports, the wheat being delivered to these in the bag.

SOUTH AND HILLS DISTRICT.

BLACKWOOD (Average annual rainfall, 27in. to 29in.)

December 8th.—Present: 22 members and five visitors.

Wounds in Horses.—The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) gave an address on the treatment of wounds and injuries in horses. He dealt first with what was usually known as "broken knees," an injury to which horses in the hills district were rather subject. He recommended first of all a thorough cleansing with clean water in order to remove all dirt and foreign matter from the wound. A little soap in the water would do no harm. Dressings that had a tendency to dry up the wound should be used rather than oils which kept the wound moist. Powdered boracic acid, or Condy's crystals, at the rate of one flat tablespoon to a gallon of water, or powdered washing soda, or preparations containing alcohol were all useful for the first applications after injury For healing purposes, and to encourage the growth of hair, once or twice a day a tincture of iodine might be applied, mixing one dram of pure iodine in one pint of methylated spirits. Sometimes, when the wound had filled up and was looking healthy, there was a tendency for it to crack. In such cases carbolic oil, or a similar dressing which would keep it soft, should be applied. In the summer-time it might be necessary to apply something to keep off the flies, and a little Stockholm tar or hog's lard, or a weak solution of lysol, or other coal tar preparation, would prove effective for this purpose. Should there be any sign of proud flesh a pad of wool or tow sprinkled with boracic acid, or boracic acid and flowers of sulphur mixed, should be applied and secured by means of a tight bandage on the wound. Where there was a good deal of loose proud flesh on any wound of this character it could be removed with a knife or searing iron, the latter for preference, as bleeding followed the use of the knife, and must be stopped by the application of hot iron. An old table knife made "cherry red" in the fire would prove very useful for this purpose. Sometimes it would be found that joint oil ran from the wound for a week or more, and that there was a small pipe formation which showed no sign of healing. The application of a little dry chloride of lime daily would check this. In the case of wounds caused by "staking," the veterinary surgeon said that it was essential that the bottom of the wound should be thoroughly cleansed, for if any foreign matter remained trouble was bound to occur. By means of a syringe a plentiful supply of disinfectant, such as 2ozs. of washing soda in a gallon of water, or a 2 per cent. solution of some coal tar disinfectant or Condy's fluid, should be forced into the wound. Absorbent wool or gauze should then be worked into the bottom of the wound by means of a piece of clean wire which has been disinfected by heating until nearly red hot. This wool should be removed each day and replaced with a fresh lot. It should be remembered that the wound must be allowed to heal from the bottom upwards, and not from the top. Sometimes pouching of the skin followed the healing process, and where this occurred it was necessary to make a hole at the lower end of this pouch in order to keep it drained. A piece of tape passed through the lower end would serve this purpose. The tape should be dressed daily with a little turpentine. Where the foot had been bruised and cut by a stake or stone it was generally found that the wound was larger in the interior than on the outside, and it was necessary to prevent the outside closing up until complete healing had taken place, otherwise there was great danger of tetanus or lockjaw. He advised opening out the entrance of the wound, to allow of discharge, and plugging the opening with wool or tow dressed with Stockholm tar. The wound itself should be dressed with a volatile antiseptic, such as turps, benzine, or petrol, and not with any heavy oily substance, and might be plugged with wool or tow soaked in benzine or petrol. Some of the most difficult injuries to deal with were those caused by horses getting their feet caught in barbed wire, and not infrequently it became questionable as to whether it would pay to treat them. Where the fetlock was very badly injured he was doubtful that it would pay in the case of an old horse of comparatively little value ; but in the case of a young horse he advised dressing twice daily for a week with tincture of iodine, then covering the wound with Stockholm tar and turn the animal out for two weeks. If, after that period, any part of the wound required dressing, turpentine or benzine should be used, and a dressing of Stockholm tar again applied. A complete cure was slow, but he had had a number of instances where such injuries had been very satisfactorily cured under this treatment. Wounds known as "fistulous" were very difficult to heal owing to the presence of dead tissue at the bottom of the wound. The only effective treatment was to use the knife to remove the cause of the mischief, and then apply plenty of cold water for an hour or more daily. Sometimes they were troubled with ulcerating wounds, probably due to foreign matter, which must be removed as well as the proud flesh surrounding it. Burning with a hot rod, or the application of a tight rubber band above the wound for 10 or 15 minutes the first day, for one hour the second day, and two hours a day afterwards would probably be effective. At the conclusion of Mr. Place's address a number of questions were asked and answered. In the case of a horse whose teeth and mouth were apparently good, but who slobbered a good deal and vomited up a portion of its food, Mr. Place recommended using a dessert spoonful of Fowler's solution of arsenic in the chaff night and morning for two weeks. The trouble was rather common, and was due to contamination of the chaff with microscopic vermin which bred in the gullet and stomach. When the food was taken into the gullet irritation was caused and portion of the food was ejected. Greasy heels should be prevented by leaving the hair at the back of the fetlock and drying the heel well after exposure. In mild cases an ointment composed of camphor 1oz., lard 4ozs. could be applied. When the heels crack a dry dressing of camphor one part, oxide of zinc four parts was recommended. When really bad and grape-like growths existed, white lotion consisting of sugar of lead ½oz. and sulphate of zinc ½oz. to a pint of water, or better, equal parts of methylated spirit and water should be applied frequently, and followed by a dry dusting of sulphur one part, boracic acid seven parts.

CHERRY GARDENS (Average annual rainfall, 35·03in.)

December 9th.—Present: 15 members and a large number of visitors.

Social.—A social gathering was held to celebrate the coming of age of the Branch. Addresses were delivered by Messrs. S. W. Chapman, T. Jacobs, C. Ricks, S. H. Curnow (Cherry Gardens Branch), W. H. Hughes (Longwood), A. Phelps (Clarendon), and C. Morgan (Ironbank), and the following officers of the Department:—Mr. W. L. Summers (Secretary to the Hon. Minister of Agriculture), C. G. Savage (Manager Government Experimental Orchard, Coromandel Valley), and G. G. Nicholls (Secretary Advisory Board). The remarks of the evening showed that the Branch had played an important part in the development of the immediate district, and had not been without its influence upon the Bureau generally.

HARTLEY (Average annual rainfall, 15in. to 16in.).

November 5th.—Present: 18 members and 10 visitors.

Annual Inspection of the District.—On Wednesday, November 5th, members met at the council hall and drove in the direction of Callington. The crops inspected presented a somewhat uneven appearance, rather poor crops being close to those that were good. Although this feature was clear to the observer, it could not be accounted for, as in many instances the land seemed to be similar. At Mr. A Stein's a splendid crop, the best seen for the day, was noticed. Here haycutting was in full swing in a crop of Silver Baart. Sixty acres of White Tuscan also looked well and was estimated to yield nearly 3 tons to the acre. Passing on to Mr. F. Lehmann's farm, the visitors spent a good deal of time inspecting his lucerne plots. These were looking very well, being irrigated from the river, the water being conveyed along a channel at the high side of the lucerne. The channel was tapped at intervals and the water supplied to the lucerne where required. A hydraulic ram pump, which had a lifting capacity of 80ft., was also seen on this farm. At an early date Mr. Lehmann proposed to convey the water to the house and stables from this pump. After lunch, which was kindly provided for the visitors by Mr. Lehmann, the farm of Mr. F. Bruns was inspected. Here the land was irrigated by means of a 6-h.p. petrol engine and a centrifugal pump. Mr. Bruns used the river water, and could supply his lucerne with 12,000galls. an hour. Mr. B. Wundersitz was the next place of call. Here the crops were looking fair; rust was noticeable, but mostly on the flag of the wheat. Lucerne presented a nice appearance. Mr. Wundersitz proposed to graft on to his hardshell almonds the softshell variety. There was a fine growth of wood on the old stumps, and should the grafting prove successful it would not be long before the trees were profitable. The evening was spent in a social manner. Mr. Wundersitz placed his large barn at the disposal of the members and friends. Here they partook of the hospitality of Mr. and Mrs. Wundersitz. After dinner had been served the Secretary of the Advisory Board of Agriculture (Mr. G G. Nicholls) delivered an address. He advised the farmers to ascertain by accurate experiments the requirements and capabilities of their various soils, and to let their neighbors know the results. He expressed pleasure in being present, as he could see that this Branch of the Agricultural Bureau was well to the front from a social aspect, and he had seen, in passing from farm to farm during the day, that they were live members, and possibly the better farmers for being connected with the Bureau. He wished the Branch every success, and expressed indebtedness to Mr. and Mrs. Wundersitz for their hospitality. Mr. Pyne indorsed the remarks of Mr. Nicholls as to the value of the Bureau in this State. The farmers owed a good deal to the Roseworthy College, as, no doubt, many practices that they were adopting to-day sprang from that centre. Mr. Taylor, on behalf of the visitors, and Mr. Beavis, on behalf of the members, heartily thanked Mrs. and Mr. Wundersitz.

INMAN VALLEY (Average annual rainfall, 26in. to 27in.).

November 12th.—Present: 17 members.

Hay-Making and Grain-Harvesting.—In a paper on this subject Mr. E. A. Scarfe said wheaten hay should be stooked in long rows, not too wide, directly after cutting, but oats might be allowed to lie for a few hours. Wheat for hay should be cut when the bottom of the straw had become white and the flower or pollen had fallen. If cut too green it would be spongy and light. Oats should be left until the grain was forming and turning brown. Sheaves should be of good size, and not tied too close to the heads, The hay should be left in the stooks for at least 10 days, and longer if it were to be put into a large stack. If hay taken from the centre of the sheaves would crack at the nodes there was no danger of it sweating. The stack should be gradually built out to eaves and be kept high in the middle, especially when nearing the roof, in which the sheaves should be placed heads outward. For harvesting the grain crop the damp-weather stripper and winnower were better than the harvester for this district. With the stripper the chaff was saved, and the land was kept much cleaner. Whilst on level land the grain was bagged much more quickly by the harvester, it did not do such good work in hilly country. When harvesting operations were completed, it was a good policy to cut straw and place a stack in the paddock for shelter and feed for stock during winter. Federation wheat straw was not suitable for this purpose. The average weight of a sheaf was about 8lbs. The saving of hay effected amply compensated for the cost of erecting a hay shed. Mr. Jagger thought a stack thatched too soon after carting would probably settle and allow the ingress of water.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

November 15th.—Present: 11 members and a number of visitors.

Homestead Meeting.—The meeting was held at the homestead of Mr. W. H. Hughes. Plots of fodder plants and grasses were inspected with interest. Crimson or Italian clover, planted in one plot with barley and vetches, and with field peas in another, was doing well. The barley, vetches, and peas had been cut for green feed. Yorkshire fog was almost ready for cutting for hay. It grew splendidly, and was considered one of the most reliable grasses for this district. Red clover or cow grass was ahead of all the other clovers. *Trifolium subterraneum* was hardy and splendid for pasture.

Bee-Keeping.—This subject was treated in a paper by Mr. J. R. Coles. He mentioned the importance of the products of honey and beeswax, and the value of the insects in effecting the fertilisation of blossoms in the orchard. Whilst generally there was the objection to apiculture that the stings of the bees were painful, competent beekeepers were agreed that when properly managed these insects rarely stung human beings. Serviceable hives could be manufactured from kerosine cases. Frames were best procured in the flat. Spare hives should be placed in sunny positions in the apiary, as young colonies would then in all probability swarm into these. If a swarm should cluster on a tree or bush, a hive containing one frame of brood and honey, with three or four empty frames on either side, should be placed directly beneath it, the bees being shaken off the bush into the hive, which should be quickly covered. Immediately the colony became settled it should be removed to its proper situation in the apiary. The colonies, which each consisted of a queen (which laid eggs to supply the brood), workers or undeveloped females, and drones, should be kept of equal strength by the weaker being supplied with combs of brood from the stronger.

Life Member.—Members took the opportunity of presenting a certificate of life membership to Mr. W. H. Hughes. This had been framed and engraved as a mark of appreciation of the services rendered by Mr. Hughes during his 21 years of membership. Several members made eulogistic references to the good work of the recipient.

MOUNT PLEASANT (Average annual rainfall, 26·87in.).

November 15th.—Present: six members.

Care of Harness.—This subject was dealt with in a paper by Mr. Tapscott. Only the best harness, he said, should be purchased, and this should be given an oily dressing before being used. When it was necessary to clean it it should be taken to pieces and washed in hot water with a little extract of soap added. After drying in the sun it should be oiled, this being allowed to dry in. Leather and copper rivets should always be kept on hand to effect repairs. Mutton fat was not a good dressing to use, as it became hard in the winter and collected dust in the summer Well-fitting collars were absolutely necessary for the horses. The Chairman (Mr. H. H. Giles) mentioned a mixture of the best neatsfoot oil and lampblack as a suitable dressing.

Stock and Crops.—It was reported that stock were doing very well. The crops were fair to good.

MYPONGA.

November 17th.—Present: 11 members and three visitors.

Sheep.—Mr. E. Everard read a paper. For this district, which experienced cold and wet winters, he said the crossbred secured by mating Merino ewes to a long-woolled British breed of ram was the best sheep. The Lincoln ram was generally favored It was well adapted to a wet climate, and produced a heavy fleece of bright, lustrous wool, although coarse. It was not so susceptible to footrot and fluke as the Merino. The crossbred combined to a certain extent the best qualities of both breeds. With the opening of the Panama Canal and the revision of the American tariff, the increased demand for crossbred wool should enhance its price, which was now little short of that of Merino. Mated with a Shropshire or Southdown ram, the crossbred ewe produced an excellent lamb for market, although the fleece would not be so good as that of the first cross. Members generally agreed with the writer. The Chairman (Mr. G. Hunt) tabled several very fine samples of wool, one from a two-year-old crossbred ewe, which cut a fleece weighing 13lbs., and one from a Merino ram which produced a fleece weighing 28lbs., being particularly admired. Flockowners could not expect to get uniform lambs, he said, when they used rams from several different flocks.

NARRUNG (Average annual rainfall, 17in. to 18in.)

November 22nd.—Present: 25 members and visitors.

Homestead Meeting.—The meeting was held at the farm of Mr. Bowyer. Six years ago this country comprised part of Narrung Station, supporting a few men and stocked with sheep, horses, and cattle. To-day it supported a large number of families, mostly engaged in the dairying industry. There were three schools on the settlement, where there were none before, testifying to the increased capacity of the land when under closer settlement. Mr. Bowyer's farm stood out as one of the best on Narrung, and was well subdivided and improved. The dairy cattle, comprised largely of the Jersey strain, were yarded and inspected by the members. These were milked by machinery. The machines were seen at work, and undoubtedly they were a great improvement on the hand milking. The shed, comprising stables, chaff shed, implement shed, engineroom, etc., was next inspected, and the chaffcutter was seen at work. This was fitted with a long elevator and carried the chaff into a loft. From there it ran down a chute fitted with a trapdoor, from which it need not be taken till required for use. The cutter was a 4-h.p. Bagshaw driven by a 5-h.p. Regal engine. One man and boy could work the plant comfortably, and thus a big saving in labor was effected. The separator and milking machines were driven by the same engine. The building and fittings were built by a local man under Mr. Bowyer's direction, and were a credit to the designer and builder. There were about 70 acres under lucerne, divided into four paddocks, all of which looked extremely well. This was cut for hay a fortnight previously and already had another good growth. The soil varied from a dark, deep sand to a red sand over limestone, and the growth seemed equally good on all soils. This has been drilled in during the last few years, mostly with the aid of light cover crops, and thrived without any irrigation. Potatoes and maize were seen to be doing well, and nice crops of oats just ready for the binder were noticed. After the inspection of the farm and stock was completed the members partook of afternoon tea, kindly provided by Mrs. Bowyer.

On December 22nd the Government Dairy Expert (Mr. P. H. Suter) delivered an address dealing with the different types of dairy cows, the secretion of the milk, &c.

STRATHALBYN (Average annual rainfall, 19·28in.)

December 9th.—Present: 12 members.

Red Rust.—After discussion, members concluded that the wheats which had suffered least damage from red rust were John Brown and Crossbred No. 52. Early sown crops suffered most, Federation especially.

URAIDLA AND SUMMERTOWN (Average annual rainfall, 44·35in.).

November 3rd.—Present: 11 members and two visitors.

Rhubarb.—Mr. G. Prentice read a short paper on the cultivation of rhubarb. Land for planting with this crop should be broken or trenched to a depth of at least 18in., he said. One hundredweight of bonedust should be dug into each rod of land, which should be planted with the crowns 3ft. apart each way. The first crop should be allowed to die back. The best selling variety was the very red Cherry rhubarb, but this was not a good cropper except in swamp land, where it did well under irrigation. One bag of bonedust should be applied to each four or five rods annually, and after each pulling the soil should be well hoed. Carefully cultivated a crop of 12lbs. per crown per season should be secured. Members generally agreed.

CHERRY GARDENS, November 11th.—**Crops in District.**—It was reported that in many instances the hay crops in this district were very good, the late rains having had a very beneficial effect. Some of the late-sown crops, however, were thin and light. The pea crop promised well.

KANMANTOO, December 11th.—LECTURE.—An interesting address, describing a trip to West Australia, was delivered by Mr. W. G. Mills.

MEADOWS, November 11th.—An interesting paper dealing with submarine photography, insect life, &c., was read by Rev. J. W. Williams.

MENINGIE, December 20th.—Members discussed the subjects of "Noxious Weeds" and "Diseases in Sheep," with the result that a profitable evening was spent.

MOUNT BARKER, November 12th.—WOOL.—Mr. Henshaw Jackson (Wool Instructor attached to the School of Mines) delivered an address and demonstration on the preparation of wool for market. A number of questions were asked and satisfactorily answered.

PORT ELLIOT, November 15th.—FARMYARD MANURE.—Members were of the opinion that it paid to preserve farmyard manure (by placing it on a layer of seaweed and covering it with the same) for green fodder crops and potatoes, but the use of chemical fertilisers was more profitable with cereals.

SOUTH-EAST DISTRICT.

KEITH (Average annual rainfall, 19·20in.).

November 5th.—Present: seven members and three visitors.

INSPECTION OF DISTRICT.—Members made their annual inspection of crops in the district. A well-grown crop of oats, but rather thin, and estimated to cut about 1¼ tons of hay to the acre, was noticed on the farm of Mr. Wilmitz. Adjoining was a crop of oats estimated to return 20bush. to the acre, and one of wheat expected to return seven bags to the acre. Mr. Graves' crops were looking well, and on Mr. Dall's property a small paddock of rye was standing about 4ft. high and promised a good return of seed. It had been fed off until September. Barley which had been fed off until the beginning of October, was expected to yield from 15bush. to 20bush to the acre. Mr. Dall estimated that feeding down these two plots, which were each 10 acres in extent, had saved chaff to the value of £30 during the year. The wheat crops, sown on well-worked fallow, stood about 5ft. high. Hawkes' Rustproof was estimated to yield 27bush. to 30bush. to the acre. Mr. J. Bice's crop, on land ploughed, drilled, and then harrowed, promised a return of 15bush. to 18bush. per acre. At Mr. Makin's, where afternoon tea was served, the fruit, flower, and vegetable gardens looked extremely well. A paddock which had been cropped with hay last year carried a nice growth of barley and oats. One hundred acres had been fallowed and drilled with barley and rape, on which 500 sheep were fattened. The area was now carrying a heavy crop of wheat and oats for hay. A crop at Mr. Pearson's, sown on new land during the third week in August, looked well. Members were convinced that good crops could be grown in this district on well-worked fallow.

Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S. (Superintendent of Agriculture in the South-East) delivered an address in the evening.

KYBYBOLITE (Average annual rainfall, 22·00in.).

November 13th.—Present: eight members and two visitors.

DISEASES OF FRUIT TREES.—Mr. Leishman contributed a paper in which he dealt with various fruit tree pests which he had noticed in the district. Curl leaf of the peach, he said, was an endophytic fungus, the spores of which lodged under the scales of the buds during the winter and germinated when the sap rose in the spring. Preventive treatment consisted of spraying with Burgundy or Bordeaux mixtures as the buds were swelling. If the tree had been badly affected in the previous year it should be sprayed when the buds were dormant and again when they swelled. Shothole fungus of the apricot was controlled by spraying with Bordeaux mixture when the flowers were open, and again when the fruit had formed. Peach aphides wintered on the roots of the trees. These were sucking insects, hence arsenate of lead sprays were useless. They should be suffocated with tobacco wash, resin wash, or kerosine emulsion. The curculio beetle was a chewing insect, which attacked especially the young and tender shoots of the trees. The larvæ evidently developed in the soil, and in the early spring the beetles attacked the trees at night. A misty spray of 1lb. arsenate of lead to 8galls. of water, or dusting the trees with 1oz. Paris green mixed with 50ozs. flour when they were wet with dew was effective. Poultry would also effectively destroy the pest. The codlin moth was also a chewing insect. During the winter it rested as a white caterpillar in a watertight cocoon. The moth emerged about the time of the flowering of the fruit. The females deposited eggs on the fruit and leaves. Young caterpillars emerged from these within about a week, and crawled to the calyx of the fruit. These caterpillars were fully developed by the time the fruit was about quarter grown. They produced a second brood of moths in the course of a few weeks, and these deposited their eggs on the almost fully grown fruit. Treatment consisted of spraying with arsenate of lead. The first application should be made just after the petals of the flower had fallen, the spray being directed into the calyx cups. The second spraying should be given in from seven to 10 days, a third at the expiration of a fortnight, and others at intervals of four or five weeks. Later ripening varieties of pears and apples should be sprayed as late as February to destroy the second brood of caterpillars. Bandage traps should be examined once a week.

MILLICENT (Average annual rainfall, 29·25in.).

November 11th.—Present: five members.

Fallowing.—In a discussion on this subject Mr. Mitchell thought it paid to fallow land on the Millicent Flats. The grass destroyed was of considerable value, but the increased return in crop compensated for it. Where the land was suitable, however, a summer fodder crop, such as rape, should be sown. Mr. Searle commenced ploughing as soon as possible after harvest, and continued to work the land till seeding time. He had obtained good crops for many years by so doing. Mr. Holzgrefe also favored ploughing during the dry weather. He contended that land in this district was too costly to be left out in bare fallow. Clean crops would be secured if sheep were put on the land during the spring. Members agreed that a catch crop on fallow was profitable. Green feed was of considerable value to young sheep during dry seasons.

NARACOORTE (Average annual rainfall, 22·60in.).

November 8th.—Present: 13 members.

Poultry-Farming.—A lengthy paper was contributed by Mr. F. A. Holmes. He dealt with the importance and prospects of the industry, and emphasized the necessity for perseverance and patience in order to make the business pay. The best stock from proved laying strains should be procured. Chicks should be hatched about September, and in no case after November. The White Leghorn was the best egg-producing breed, other good varieties being Black and Buff Orpingtons, Minorcas, and Andalusians. The Silver Wyandottes and Black Orpingtons were good dual purpose fowls. The essential, however, was to secure a good strain. Generally, a hen over two years old did not lay more than sufficient to pay for her food. Two or three cockerels were enough to fertilise all the eggs the average farmer would need to hatch. Crossbred fowls he thought did not lay as many eggs as the pure bred. When possible a site for the pens should be selected on a slope of dry, sandy, porous soil. Breeding pens could be made 10ft. wide and 40ft. or 50ft. long. These would accommodate eight or 10 hens each. The houses should face the morning sun, be open in front, and contain perches about 18in. from the ground. Fowls roosting in trees and exposed to cold winds and frosts required more feed to keep up the bodily heat; consequently their egg-production fell away. Shade was necessary in summer. The best layers should be mated with a young, vigorous cockerel. The system of feeding recommended was—for cold mornings, a crumbly mash of two parts pollard and one of bran mixed with boiling water, and meat meal added, about 25ozs. being fed to each pen of six birds. At midday green feed should be given, and at night a good handful of grain—principally wheat—per bird. Epsom salts could with advantage be mixed with the mash in hot weather. Rabbit made an excellent substitute for meat meal. Broken china, glass, or flint grit should always be available to the hens. A few Condy's crystals added to the drinking water made an excellent preventive of disease. He preferred setting hens to the incubator for hatching chicks. The hens should not be interfered with during incubation. In the winter the nests should be made in a box, but in the spring holes could be scooped in the ground, and soft straw or grass placed in these. England imported £8,500,000 worth of eggs last year, he said, and Australia should participate in this. A lengthy discussion followed. Mr. W. H. Smith preferred hatching chicks under hens, but Mr. J. M. Wray favored the incubator. Mr. Loller thought cleaner and healthier chickens were secured by the latter method.

WIRREGA (Average annual rainfall, 19in. to 20in.).

Fruit-Growing on the Farm.—Mr. W. Fairweather read a paper, from which the following is taken :—"For a site for the home fruit garden I recommend sandy land with a slight slope towards the east; 2ft. depth of sand is the best. The land should be cropped with a cereal previously, as this sweetens the surface and destroys many fibrous roots, leaving the ground cleaner for planting. For a home garden the septuple system is best, as one gets in more trees than on the square system. The septuple system consists of laying the trees out in regular equilateral triangles, with a tree at each point. A big advantage with this is that one can cultivate between the trees in three different directions, thus reducing the hand labors to a minimum. The holes for the trees should be about 3ft. square, and the clay at the bottom broken up and left, and then mixed with some well-rotted stable manure. Procure the trees from a good nursery. I prefer small trees, as the larger are often forced in the nursery, and when transferred to our poorer soils the check is so great that their subsequent growth is spindly and weak. When planting be careful to put the tree in the same depth as it was in the nursery, and at the same time trim off any bruised or dead roots. Fill in the hole and tramp firmly round the tree. In our soils 16ft. is ample distance between the trees. I strongly advise planting the bulk of the garden in apples and pears, as they have proved by far the best, all making strong growth, besides standing adverse conditions of weather. Half an acre planted on the equilateral triangle system will carry 97 trees; on the square system only 85 trees could be planted. On this area I would put in 30 pears, 50 apples, five peach, five apricot, two quinces, two figs, three plums. The apples should constitute the bulk of the garden, as they keep well and can be dried very easily if the crop is too heavy. Have early, late, and midseason fruits, and not all ripening together. I strongly recommend spraying the peach trees with Bordeaux mixture, which consists of 6lbs. bluestone, 4lbs. lime, 25galls. water, just before the buds burst. This will prevent curl leaf, which I have noticed is thick on nearly all newly-planted peaches in this district. It is most important to cut the tree well back at planting. Do not be sparing with the pruning shears, because the fewer the buds left the greater will be the vitality of the shoots therefrom. A tree left with a lot of wood makes spindly growth, as the shoots draw too heavily on the root system before the tree is established. Remember that a good start to the tree means everything."

GLENCOE.—November 10th.—Eggs.—Mr. P. Clifford read a paper on this subject. Eggs intended for preserving, he said, should be absolutely fresh, clean, and free from cracks. If they were bought they should be carefully tested or "candled" before being put down. The receptacle in which they were stored should be earthen or wooden for preference, and scrupulously clean. Lime water solution for pickling was made by dissolving 1qt. of lime in 15qts. of water. This should be poured over the eggs, which should have been placed in layers with the small ends downward. About 3in. or 4in. of solution should cover the top layer of eggs, and light should be excluded. Lime and salt solution was prepared by thoroughly mixing 1lb. salt and 2lbs. quicklime with 8qts. of water, previously boiled. After the lime had slacked and settled the clear liquid should be poured over the eggs, packed as before mentioned. A 10 per cent. water glass solution was perhaps the best method. The dry methods of preserving were not recommended where it was desirable to keep the eggs for more than a few months. These consisted of packing in salt, dry wood ashes, wheat, bran, oats, &c.

Dairying.—At a previous meeting Mr. J. Riddoch, jun., read a short paper. He preferred the Shorthorn crossed with the Jersey for dairying purposes. Heifers should not be stinted until they were 2 years old. The bull should be kept in a small paddock, into which the cows could be turned as they came into season. Sheds and yards should be well kept, and washed after every milking. Warm milk should on no account be mixed with the cold. Oats fed green with the natural grasses provided the best fodder. Lucerne was hard to establish in this district.

Sheep.—This subject was dealt with by Mr. H. A. Cameron in a paper read at a previous meeting. If wool were the objective, he said, early autumn lambs should be bred, but care should be taken not to overstock, and the ewes should have been previously dipped when fat lambs were desired; the lambing should take place in the early spring; the lambs should be ready for market at about four months old. The best market lamb was the progeny of the Shrop. ram and the first cross or Lincoln ewe. A quick-maturing lamb was the result.

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T. PASCOE,
Minister of Agriculture

POINTS FOR PRODUCERS.

Country Conferences.

Farmers' Conferences under the auspices of the Agricultural Bureau, will be held at Orroroo (Upper North Branches) on March 20th, and at Millicent (South-East Branches) on March 25th. The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) will open the Conferences, and officers of the Department of Agriculture will deliver addresses. The Director (Professor Lowrie) and the Superintendent of Agriculture in the South-East (Mr. W. J. Colebatch) will speak at Millicent. Papers will also be submitted by members of local Branches, and these, with the addresses by officers, will be open for discussion and comment. Members of the Bureau may secure rail tickets at excursion fares by applying to the Secretary Advisory Board of Agriculture for the necessary certificate.

South Australian Wheat Crop.

As a result of later investigations the Government Statist (Mr. L. H. Sholl, C.M.G.) issued on Tuesday, February 3rd, a bulletin reducing his estimate of the wheat yield for 1913-14 from 19,491,585bush., average per [illegible] 9·39bush. (forecasted on November 30th, 1913), to 16,805,945bush., average per acre 8·18bush. The previous estimate, Mr. Sholl states, "was based on information contained in reports dated up to November 19th, and undoubtedly was amply justified. Unfortunately, however, immediately after the issue of the forecast the wheat districts were visited by hot winds, and in the absence of sufficient moisture in the soil a considerable decrease in the anticipated yield has resulted in practically every district in the State. To ascertain the extent of this loss all the reports were returned to the collectors early in January for revision, and nearly 300 of these have again been received and analysed. An allowance has been made for the few minor districts outstanding. As a result of the January revision, the area stripped for grain has been reduced by 21,700 acres, owing to the cutting for hay of rust-affected crops. The yield is expected to reach 16,805,945bush., and to average 8·18bush. per acre. The area for hay has been increased to the extent of 21,700 acres, making the total area 471,658 acres, with a yield of 515,331 tons, or 1·09tons to the acre." The November and January estimates of the averages per acre of the various divisions are respectively as follow:—Central 10·41bush., 9·31bush.; Lower North, 13·14bush., 11·78bush.; Upper North, 3·92bush., 3·65bush.; South-Eastern, 9·39bush., 7·56bush; Western, 6·20bush., 4·84bush.

Shop Window Displays in England.

The Trade Commissioner, in his report dated London, December 12th, states :—" From the Adelaide papers I notice that it was stated in the House of Assembly that Canada had been carrying out a propaganda of show displays for the last five years, but I would point out that such is not the case. Canada is not even to-day carrying out advertising methods in the same manner as we are doing. Their one object all along has been emigration, and not with a view of introducing the products of the country. Though Canada has not been doing it in the past, you may be interested to learn that certain of their States intend following our lead. Only this month I have had a call from a special commissioner from the British Columbian Government, who requested me to let him know the principles upon which I was working, as the British Columbian Government proposed appointing a Trade Commissioner, and from what he had heard he did not consider he could do better than follow out our principles. The South African Government also from time to time have communicated with me with a view of getting ideas as to what we are doing."

Market for Pea Nuts.

Reporting to the Minister under date London, November 28th, the Trade Commissioner states--" *Pea Nuts.* -There is certainly a considerable trade to be done in this class of goods, particularly in the north of England, but it would be quite impossible for me to give anything definite as regards price at the moment, because necessarily everything will depend upon the sample. At present, however, I may state the market is as follows :—African pea nuts, 20s. to 21s. per cwt. ; Indian, 20s. to 21s. per cwt. ; Japan, 23s. 6d. to 25s. 6d. per cwt. ; China, 23s. to 24s. per cwt. . Valencia, 15s. to 20s. per cwt. It is only fair, however, to state that these prices are rather above the normal, as stocks at the moment are short."

Newmarket Livestock Sales.

The most wonderful bloodstock sales ever held came to a close at Newmarket on December 5th, says the *Agricultural Gazette.* When at length the hammer fell on the last lot it was found that in the course of the five days 713 lots had realised 308,658 guineas. Last year 659 lots made 240,547 guineas, so that that total, which has stood as a world's record until this week, has been surpassed by 68,111 guineas. These are staggering figures. Altogether Mr. Mantascheff, the Russian enthusiast, secured 25 lots for 47,510 guineas, or just under £50,000. Last year he bought 17 lots for a little over 20,000 guineas. He is the owner of about 180 brood mares, and he has 120 horses in training.

Upkeep of Roads.

Roads of an aggregate length of 100,594 miles were maintained by the 655 rural district councils in England and Wales in 1911-12. The average cost of repairs per mile was—Main roads, £83 10s.; other highways, £24 11s.; the total cost of upkeep being £2,791,498 out of an aggregate expenditure of £4,859,402.—*Agricultural Gazette.*

Dried Yeast as a Food for Stock.

In a recent issue of the Bulletin of Agricultural Intelligence and Plant Diseases, Dr. F. Hayduck, Berlin, gives an account of the development of the dried yeast industry in Germany, and points out the value which this by-product possesses as a food for all classes of farm stock. Fresh yeast has been fed to cattle and pigs with excellent results on farms in the immediate neighborhood of breweries, but since the drying process has been introduced dried yeast can now be procured by all farmers. Dry yeast is described as one of the richest concentrated foods, 55 per cent. of the dry matter being protein. It is very palatable and easily assimilated by all kinds of livestock, and is especially suitable for fattening purposes. It possesses special dietetic properties, and its real value is therefore higher than its calculated food value. Experiments conducted at the above institute resulted in furnishing the following data:—(1) When fed to milch cows the butter-fat content of the milk was increased. (2) The health, appearance, and performance of horses were maintained when more than half of their grain ration was replaced by a corresponding quantity of nutritive substance in the form of dried yeast and dried potatoes. (3) Sheep utilised 94 per cent. of the organic matter, 88 per cent. of the crude protein, and upwards of 100 per cent of the nitrogen-free extract of the dried yeast, which was found to have a higher nutritive value than cottonseed meal. (4) Young pigs fattened readily on a mixture of dried potatoes, dried yeast, and barley, without any dairy by-products. (5) As a food for the fattening of geese, the production of eggs and good quality flesh, dried yeast was equal to meat meal.

Physiology of Sex Determination.

In a paper on the above subject, read before the Section of Physiology of the British Association, Dr. C. Doncaster suggested that all individuals, both of animals and plants, are potential hermaphrodites, the determination of sex being due to the alternative presence or absence of a Mendelian factor.

Hints on Milking.

Mr. R. W. Haydon, of the University of Leeds and Yorkshire College of Agricultural Education, in a recent lecture said that to get the most milk it was necessary to have good milkers. Some farmers erroneously thought it was a good thing to change the milkers. He contended that so far as possible they should have the same milker for a particular cow day after day, as the cow became accustomed to the particular individual, and put itself into the best milk-yielding attitude, which it would not with a stranger. In his younger days there were more women engaged in milking, and he was absolutely sure they were better milkers than men, if they had sufficient strength in their arms. The main reason was, a woman was more conscientious, she had a greater fear of not doing her duty properly. He had often seen cows turn their noses to women, but never to men. The good milking cow had a good bag, with teats about 8in. apart, and a bag covered with a thin skin which stretched. They would get more milk by milking a cow three times a day than twice, as when the bag was empty there was more secretion of milk from the blood. How much milk a cow made depended upon how much blood passed through the udder. They wanted a well-developed family gland and udder, nourished by a large quantity of blood. The nervous system affected the flow of blood to the udder, and if the milker was upon good terms with the cow and the latter felt friendly towards him, the flow of blood was increased and the more milk produced. If the milker was a stranger, or excited nervous feelings, it had the opposite effect.—*Agricultural Gazette.*

Relationship of Bovine to Human Tuberculosis.

In the course of a provincial meeting of the Royal Sanitary Institute, held at Newcastle, Mr. H. J. Hutchens, D.S.O., M.A. (Professor of Comparative Pathology and Bacteriology at Durham University), dealt with "Some Points in the Relationship of Bovine to Human Tuberculosis." Mr. Hutchens, says the *Mark Lane Express,* held that while the tuberculosis of the cow and of the human being is not exactly the same, a child infected with the cow's tubercle is liable to develop the disease in later life, the disease having been latent during a period of transmission from one species of tuberculosis to another. He inclined to the belief that adults are but little susceptible to the tubercle from cattle, and dealt with the methods to be adopted in stamping out the disease in cows, and preventing children from taking the infection. The latest order of the Board of Agriculture as to the examination of cow's milk, might tend, he suggested, to increase rather than diminish the number of tuberculous cows in the country, as it prescribed microscopical examination, which was a very inefficient method. It therefore behoved private individuals to take steps to protect children. The only way to make sure that a child shall not become infected with bovine bacillus was to insist on its not being fed with cow's milk unless the latter be boiled, and that no child at whatever age be allowed to have raw cow's milk. The reason why so many people in the present day were able to drink uncooked cow's milk with immunity was that they had acquired immunity in early days of life by swallowing small doses of living tubercle bacilli. Could the immunising dose of living virulent bovine be determined for each individual, there would be an invaluable means of preventing the disease. Experiments in immunisation were being pursued, and no doubt some day it would be possible to immunise man against tuberculosis as effectually as against smallpox or enteric fever. The paper concluded with a warning against pasteurised milk, the process of pasteurisation being described as worse than useless.

Imports and Export of Fruits, Plants, Etc.

During the month of December, 1913, 12,846bush. of fresh fruits, 450 bags of potatoes, 128 bags of onions, and 36pkgs. of plants, seeds, and bulbs, &c., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these, 162bush. of bananas (over-ripe) and 5pkgs. of plants (no declaration) were destroyed. Under the Federal Commerce Act 20 cases of fresh fruits, 26pkgs. of dried fruit, and 94pkgs. of preserved fruit, and 1pkg. of honey were exported to oversea markets during the same period. These were distributed as follows :—For London, 1pkg. of dried fruit; for Germany, 1pkg. of honey; for India, 94pkgs. of preserved fruit; for New Zealand, 20 cases of cherries; for South Africa, 25pkgs. of dried fruit. Under the Federal Quarantine Act, 1,381pkgs. of plants, seeds, bulbs, nuts, &c., were examined and admitted from oversea markets. During the month of January, 1914, 242bush. of fresh fruits, 8,802bush. of bananas, 464 bags of potatoes, and 77 packages of seeds, plants, and bulbs, &c., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910; 4bush. of mangoes (fruit fly), four packages of plants (no declaration), and 186bush. of bananas (over-ripe) were destroyed. Under the Federal Commerce Act 934 cases of apples and 1,450 packages of dried apricots were exported to oversea markets during the same period. These were distributed as follows :—For London, 1,450 packages of dried apricots; for India and the East, 934 cases of apples. Under the Federal Quarantine Act 1,239 packages of plants, bulbs, seeds, nuts, &c., were examined and admitted from oversea markets

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

Replies supplied by Mr. F. E. Place, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

" J. H. F." seeks advice in regard to the following :- -(1) A three-year-old colt had strangles 12 months ago with result that face, neck, and jaw were badly swollen. After about a month the abscess broke. (2) A mare worked in wagon all day apparently in good health, but about 9 o'clock was found shivering and breathing heavily, though not in acute pain. A 3oz. dose of Epsom salts gave relief, and she was nearly recovered following morning.

Reply—(1) The colt has chronic pyæmic abscess. Clean wound with Condy solution, and give on the tongue daily ½ dram iodide of potassium for three weeks, or if hair falls off before stop. Treatment not likely to be of much benefit. (2) The mare was apparently affected by weather, but the symptoms described are too vague to venture opinion on.

" A. C.," Telowie, had two horses sick for 10 days, supposed caused by worms. Treated for these, giving aloes, oil, and salts. The horses were scoured, and pawed, scraped, and at first passed thick water, but subsequent use of catheter had no effect. They both died, and *post mortem* on one revealed no signs of worms, and very little sand. There was an abscess on large gut, with surrounding inflammation.

Reply—The trouble was pyæmia or blood poisoning, commonly called influenza. Purgative physic was just the wrong treatment, and probably induced the inflammation. In a similar case, stop work at once, give bran mashes only, 10 drops tr. aconite three times a day for three days, and things will probably go better.

" H. P.," Coomandook, has three horses which became hot and trembling. This was followed by swellings on shoulders, neck, belly, and chest. The swellings break and discharge, leaving hollow under skin. The horses have gone lame.

Reply—These are the symptoms of what is commonly called influenza or, technically, lymphadenitis, and show that the blood is invaded by parasites which produce the symptoms. Treatment—Stop work and give bran mashes or green food, 1oz. Epsom salts three times a day in food or, better, 1oz. hyposulphite of soda in food three times a day, and as recovery sets in 1 dram of sulphate of iron and 4 drams sulphur twice a day in food. Wash discharges with Condy's crystals, as much as will lie on a threepenny piece to a pint of warm water, and use with boracic acid after. The lameness may be muscular, for which the above treatment suits. If, however, laminitis sets in, then the feet must be well soaked in hot water or poultices applied as well.

"J. J.," Cleve, has a mare suffering from a heavy cold, with copious discharge from nose. The trouble appears to be mostly in her throat; she half chokes and roars, and the food comes through her nose.

Reply—From the symptoms the mare has a very severe sore throat, probably due to strangles. Feed on sloppy mashes and good sweet hay steamed. DO NOT ATTEMPT TO DRENCH. Steam head well several times daily with a few drops of turpentine or eucalyptus oil on the steamer. Give 10 drops of veterinary tinct. belladonna in a little sugar on the tongue twice a day, and alternate with a similar quantity of arsenicum twice a day. Feed and water from the ground and keep head low when steaming.

"P. R. P.," Clare, asks for treatment for two-year-old filly affected by number of warts round nose and mouth. The filly is in low condition, but appears to eat well.

Reply—These are not contagious, and will probably disappear if you rub the nose with castor oil one day and vinegar the next for a few days. If this does not answer, tr. thuya, 1oz. to 1 pint water, a little applied daily, will move them. As the filly appears low in condition it would be well to let her have once a day a powder consisting of arsenic 1gr., nux vomica 20grs., sugar to hide taste; or veterinary arsenicum, 10 drops morning and evening on the tongue for 10 days.

"Inquirer," Manoora, seeks advice regarding treatment for foal suffering from scrotal hernia.

Reply—Treatment depends on extent of rupture. If severe, probably best to have castrated by covered method; if not larger than an orange, wait and see, as it may reduce naturally; but it must be remembered when the time comes for castration.

The Crystal Brook Branch Agricultural Bureau asks for remedy for fly nuisance in stables.

Reply—Flies breed in horse dung, therefore do not leave it about. Put down tins containing milk and water, with a tablespoonful of formalin and a bit of crust for the flies to settle on. Do this when horses are out. Hang up bunches of gum leaves, and in evening slip a paper bag over each when the flies have settled; screw it up and burn. Do this every night, away from stable. Smear horses legs with refuse machine oil.

"H. S.," Crystal Brook, has a mare with mange on shoulders. He inquires treatment.

Reply—Bring the animal out into the sun; wash well all over with carbolic soft soap; dress with train oil and sulphur, ½lb. to gallon, over affected parts. Repeat every week till cured, and then every three weeks.

"A. J. H.," Mount Gambier writes that he has two cows suffering from what is commony termed redwater. Both animals have had natural grasses only and are in good condition.

Reply—There are different forms of redwater, such as Queensland tick fever, which, fortunately, has not spread as far south as South Australia. Another form is due to constitutional disturbance after calving, but the more common is a form carried from animal to animal by means of biting flies, which inject into the system tiny animal germs, which break down the red blood cells, the coloring matter of which is passed off in the urine. *Post mortem*, the liver will be found to be large, soft, and light in color, and the spleen will also be enlarged. If you could get someone to make blood smears and send them for examination it would be a help. Treatment varies. Often a pound of Epsom salts is followed by a cure, but probably you will be better satisfied by giving a pint or two of yeast. Move the cattle from the place where the disease occurs to higher, drier ground. The disease is not immediately contagious, but an affected beast becomes a source of danger because the poison is obtained from it for the infection of others.

WOOL.

The Booleroo Centre Agricultural Bureau asks—Will sheep that have produced dark, heavy wool, and those that produced hard, greasy wool, clip the same kind of wool each year?

Reply—Mr. Henshaw Jackson, the Wool Expert, states in reply—"It is quite likely that the sheep mentioned will go on producing the same kind of wool, so far as color and condition of yolk is concerned, each year. The quantity of yolk will, of course, vary with the seasons and feed; but color and quantity, apart from seasonal variations, are constitutional. I have had individual sheep that year after year came to the shearing with much heavier and darker wool, so far as yolk is concerned, than others running with them under exactly similar conditions, and at time of replying have a couple of sheep in a small flock of 10 which showed this peculiarity when shorn last year, and bid fair to produce it again next shearing."

ASH FROM GRAPE STEMMINGS.

Two samples of ash were submitted to the Agricultural Department for analysis by the Renmark Agricultural Bureau. The following is the result:—

	Per cent.
Sample No. 1.—	
Insoluble matter (silica, &c.)	45·96
Total phosphoric acid (P_2O_5)	2·26
Total lime (CaO)	9·54
Total potash (K_2O)	12·00
Water soluble potash (K_2O)	10·80
Sodium chloride (*i.e.*, chlorine expressed as sodium chloride)	2·39
Sample No. 2 (ash more granulated)—	
Insoluble matter (silica, &c.)	31·47
Total phosphoric acid (P_2O_5)	4·45
Total lime (CaO)	13·53
Total potash (K_2O)	22·47
Water soluble potash (K_2O)	19·31
Sodium chloride (*i.e.*, chlorine expressed as sodium chloride)	3·36

These analyses show that this ash though produced in small quantities is well worth husbanding carefully. If the analyses be compared with that of kainite as put on the market, guaranteed 12 per cent. or 12½ per cent. of potash, it will be noted that in the first sample the percentage of potash approximates to the percentage of potash in kainite, while in the second sample there is more than one and a half times the potash present in kainite. Kainite is quoted in England at £2 10s. to £2 12s. 6d. per ton in bags, and in Australia at £4 per ton or over. But this ash as a mineral manure has considerable commercial value additional to its potash content in that it contains 2·26 per cent. phosphoric acid in the first sample and 4·45 per cent. in the second, equivalent to 4·9 per cent. and 9·7 per cent. phosphate of lime respectively. Further, the percentage of lime present would increase the value of this ash as a mineral manure.

As the potash, phosphates, and lime in such ash are present in forms particularly readily available for plant life, it will be recognised that there is here a valuable manurial substance worth, if the quality could be maintained, from say £3 to £5 10s. per ton or over, according to market rates for manures. Small though the quantity produced be, it should therefore be carefully saved for application to the land.

SOME PARASITES AFFECTING FARM ANIMALS.

By F. MURRAY-JONES, L.V.Sc., Veterinary Department.

(*Continued from page* 653.)

TREMATODA LIVER FLUKE (*DISTOMA HEPATICUM*).

This variety belongs to order of Trematoides. They are found in sheep, cattle, and occasionally in horses. They are small and flat like a miniature flat fish. They live singly, and during development pass through a most complicated series of developmental changes. Briefly, these changes are as follows :—First, the ova or egg passes from intestine of sheep with the fæces. In four to six weeks, if weather favorable, they develop into embryos with a hairy skin and a borer in front. These in turn bore into the body of the freshwater snail (*Linnæus truncatulus*). The distribution of this snail corresponds to that of the fluke. They are very small, and live on land as well as in water. In 14 days (summer), three to four weeks (winter), they develop into a germinal bag (sporocyst) with germinal cells. By a system of stretching of these cells we get tubes of immature flukes (*Rediæ*), and from these are directly produced the true brood called *Cercariæ*. These little chaps, so small as to be only discernible under a microscope, are like tadpoles, and live freely in water. An idea of the number produced can be obtained by remembering that one egg is capable of producing 1,000. These little swimmers attach themselves to grass blades and become encysted. They lose their swimming tail and develop a tough mantle, which protects them during their waiting period.

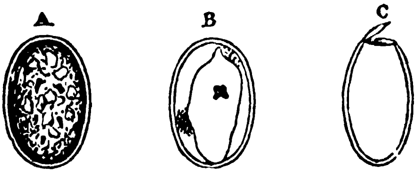


FIG. III.—OVA OR EGG OF FLUKE (*Distoma hepaticum*).
A. Ovum from the bile duct of sheep.
B. Ovum containing developed embryo.
C. Ovum after hatching, showing lid.

Later on, sheep grazing ingest the grass, and with the grass also these little encysted bodies. Infection may also take place by swallowing snails, or even drinking water in which the *Cercariæ* are swimming.

Reaching the sheep's stomach, the gastric juice dissolves the hard covering, and the young flukes are liberated. They pass on into the small intestine, and crawl up the bile duct and finally reach the liver. Here they remain and develop into the adult fluke, reproduce their eggs, which escape down the track of the bile duct, and reach the intestine. Here they are finally discharged with the fæces, and are ready to again travel the cycle of above development.

THE EFFECT OF FLUKE ON SHEEP.

An animal may be infected for some time and apparently little disturbed by their presence, even in some cases distinctly putting on flesh. Wasting generally takes place during the end of second stage of the disease, and then it is generally rapid. The parasites which have been drawing on the animal's blood for so long produce a condition of anæmia and some infection of the bile duct. This generally produces a state of icterus or jaundice; hence one may see on examining the eyes that tingeing of greenish-yellow due to bile. This discoloration is often so pronounced that although we have not a condition of wasting, the tissues are so discolored that it (the carcass) becomes unfit for human food. The third stage is accompanied by general wasting. If you should examine the liver of an animal destroyed or dead from this disease, you would find the liver enlarged, harder than normal, and a thickening of the bile duct, together with the presence of a gritty or calcareous

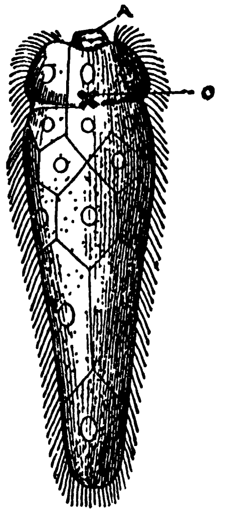


FIG. IV.—FREE CILIATED EMBRYO (*H. distoma*).
A. The borer. O. The eye-spot.

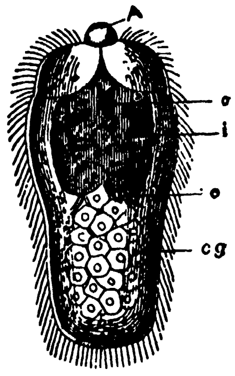


FIG. V. THE SAME CONTRACTED.
i. Digestive canal.
cg. Germinative cells.

substance. Heavy losses occur in different parts of Australia as the result of these parasites, particularly with sheep. They occur generally in low-lying, swampy ground.

TREATMENT.

This consists above all in exercising preventive measures. Pastures get more dangerous as winter sets in. Wet ground should be drained and sprinkled with lime and salt. Rock salt should be supplied to sheep as licks. Salt destroys the young, immature parasites in the stomach of an animal. A good lick for sheep is 1lb. sulphate of iron, 2lbs. salt, 8ozs. sulphur, 4ozs. gentian. Dose—2ozs. per head per day for 10 days, in food.

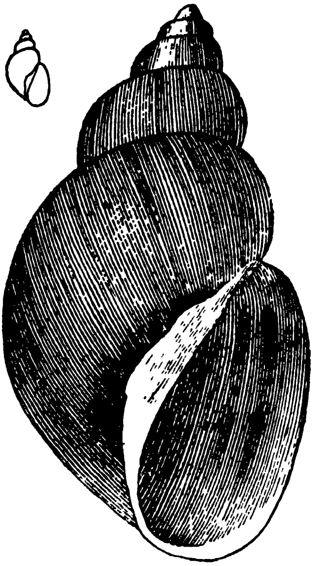


FIG. VI.—FRESHWATER SNAIL (*Limnæ truncatula*). This harbors the fluke embryo. The smaller one, natural size.

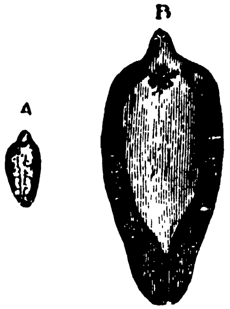


FIG. VII.—THE FLUKE (*Distoma hepaticum*).
A. A young specimen } Natural size.
B. The adult }

NEMATODES.

The most important order in this group is the *Ascarides*. The *Ascarides* are round worms, and several varieties are found in our different domestic animals, *i.e.*—

1. *Ascaris megalocephalus*, found in intestine of horse.
2. *Ascaris marginata*, found in intestine of dog.
3. *Ascaris mystax*, found in intestine of cat.
4. *Ascaris lumbricoides*, found in intestine of man, cattle, pigs.
5. *Ascaris suillæ*, found in intestine of pig.

The *A. megalocephalus* presents the general features of this order as follows:— It resembles the earthworm in shape. It is yellowish-white in color, stiff and elastic, 6in. to 14in. long, and generally resides in small intestine. Sometimes it travels forward to stomach. They gain entrance to animal's body with drinking water and damp forage. The eggs of the worm are never hatched in the body, but are expelled with the dung. As a rule they cause little or no trouble beyond perhaps absorbing food fluids stolen from the host. If a horse is badly infested, he falls away in condition, coat gets rough and staring, becomes "pot bellied," colicky, and perhaps slight diarrhœa due to irritation. If the animal is affected, one or two worms at least will be found in the dung. They have been known to perforate the bowel.

Life History.

The history of the *Ascaridus* is not very clear. The present opinion held is that an intermediate host is not necessary for completion of the life cycle, and infection generally takes place by the animal swallowing the egg derived from an infected animal.

Treatment.

Tartar emetic, ½ dram; sulphate of iron, 2 drams; to be given as powder three times a week; follow up with a pint of raw linseed oil at end of week. During treatment keep animal on short ration with liberal supply of bran. Tartar emetic has a specific action on the worm, and does not depress the horse. Repeat above treatment after 14 days if necessary. Follow up with 1 dram of sulphate of iron once daily in feed for 14 days. Turpentine may be given, 1oz. to 2ozs. in pint of raw linseed oil. Care should be taken with turpentine, as it has a stimulating effect on kidneys.

STRONGYLES.

Several members of this family are responsible for great losses amongst our sheep and cattle. Their special place of abode is found to be the bronchial and lung tissues.

Strongylus micrurus is found in the lungs of cattle, and may give rise to bronchitis, and even induce a state of mechanical pneumonia.

Strongylus filaria.—This one is found in sheep and camels, and is often spoken of as the husk worm. At times great losses in sheep occur as a result of its presence. This worm is a white thread-like worm, and is found only in the bronchial tubes; whereas the *S. rufescens,* or the red worm, is found in the lung tissues.

Strongylus rufescens.—This worm, as already stated, is found in the substance of the lung, and gives rise to formation of nodules in lung. These two preceding ones produce a condition of bronchitis, and spoken of as husk.

In parasitic bronchitis great numbers of eggs and embryos are expelled from mouth and nostrils by the continual coughing induced by the irritation of their presence. The female worm is capable of discharging several million of embryos, and these find their way to soil; but these require an

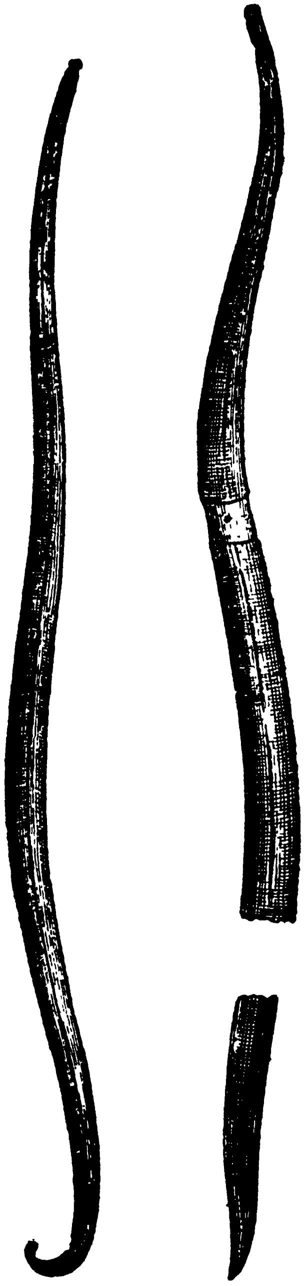


FIG. VIII.—THE COMMON ROUND WORM (*Ascaris lumbricoides*). Male and Female.

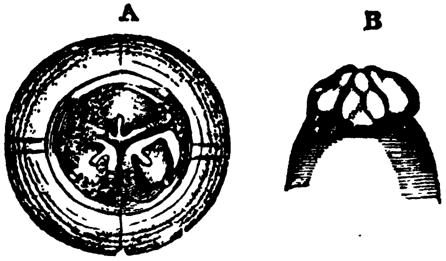


FIG. IX.—HEAD OF COMMON WORM. A. Front view. B. Dorsal view.

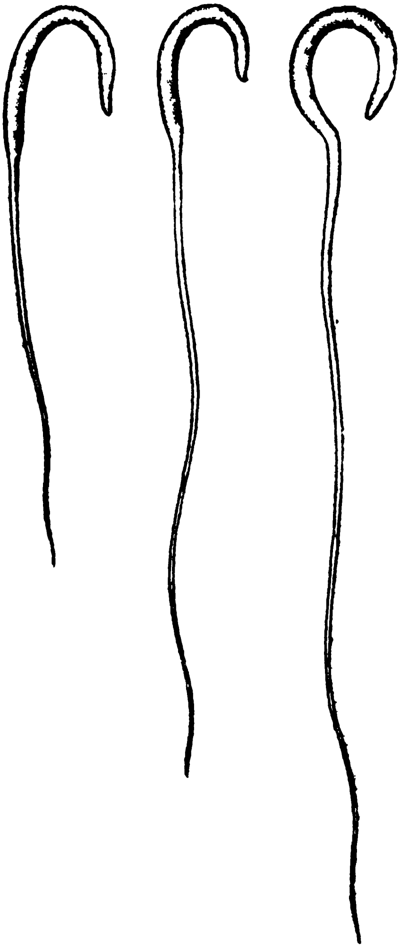


FIG. X.—PIN WORMS (*Oxyuridæ*). Natural size.

intermediate host before infecting sheep or cattle. It is thought that the intermediate host is the earthworm. After passing through the body of the earthworm it again reaches soil, so that infection follows the ingestion of food or water contaminated with their presence.

PREDISPOSING CONDITION.

Over-stocking; reduced vitality of animals through insufficient or innutritious food; low-lying, swampy ground, and infected and stagnant water supply.

PREVENTIVE MEASURES.

Same as recommended for flukes. Liberal feeding, sulphur and salt licks, draining soil, fencing stagnant water, avoiding swampy ground, top-dressing land occupied with sick animals with salt and lime.

OXYURIDÆ—THREAD WORMS.

Oxyuris curvula.—This worm is about 1in. to ¾in. long when fully grown; its tail is thin and whip-like. The front end is thicker and the tail ends in a curve. These worms generally affect the animal more as an inconvenience than one productive of any special harm. The animal is irritated about the dock, and may be seen rubbing the tail vigorously against a door, fence, or vehicle, sometimes so much as to wear the hair off the dock. Around the fundament will be found a collection of mossy-like substance and a light-yellow material containing the eggs of the parasite. Thread worms, like the round wo ms, frequently come away in the dung.

TREATMENT.

Clear out back passage and then inject an enema of warm, salt water. Follow this up with an injection of linseed oil, to which has been added 1½ozs. of turpentine. A solution of tannic acid may also be used in the same way. Should a couple of attempts in the above way be non-successful, probably the worms are too far forward to be reached by this method. Resort to methods already advised for large round worm.

(To be continued.)

LADS FOR SOUTH AUSTRALIAN FARMS.

In the January issue of the *Journal* there appeared an article written by Mr. T. E. Sedgwick, an English gentleman who is keenly interested in junior migration from the United Kingdom to the Oversea Dominions of the Empire.

As indicated by Mr. Sedgwick, the South Australian Government have now decided to act under the provisions of the Immigration Act Amendment Act of 1913, and preliminary arrangements are being made for a party of 50 lads to arrive in South Australia in May next for apprenticeship to farmers. The Commissioner of Crown Lands and Immigration has given instructions to the Immigration Department to issue a circular, of which a copy is published below, to farmers and other producers inviting applications for boys. As the first party will probably be over applied for, early application will be necessary to secure one of them.

The circular issued by the department is as follows :—

IMMIGRATION DEPARTMENT.—BOYS FROM GREAT BRITAIN TO BE APPRENTICED TO FARMERS AND OTHER PRODUCERS.

The Government desire to bring under the notice of farmers and other producers the Immigration Act Amendment Act of 1913, and the regulations thereunder, which provide for the introduction from the United Kingdom of boys between the ages of 15 and 19 years who are physically capable of and wish to take up farm, garden, or station work.

APPRENTICESHIP.

Every boy coming to the State under the provisions of the Act will be placed out or apprenticed for a period of not less than one year nor more than three years. (The first party will probably be apprenticed for three years.) The form of agreement to be signed by the boy and the employer is prescribed by the regulations, and a copy is forwarded herewith. The fact that the boys will be apprenticed is expected to appeal strongly to employers, as they will be able to obtain the benefit of the training they have given the boys, and will not feel that by taking extra trouble in teaching them they are likely to lose their services in the immediate future. The Act provides for a penalty not exceeding £20 against any person who counsels or induces any boy to break his agreement or abscond from his employer.

WAGES.

Employers are asked to state in the appended form of application the minimum rates of wages (in addition to board and lodging) which they are prepared to offer. It will be observed that the form provides for the rates offered being increased during the period of the apprenticeship, and in a pamphlet distributed in the United Kingdom the boys have been informed that it is anticipated that the minimum rates will be as follows :—

First four months ...	8s. to 10s. per week with board and lodging.
Balance first year ...	10s. to 15s. per week with board and lodging.
Second year	12s. 6d. to 17s. 6d. per week with board and lodging.
Third year	15s. to 20s. per week with board and lodging.

With double the rates mentioned in each case during the harvesting period.

Saving Wages.

The agreement provides that each boy will be paid out of his wages 2s. 6d. per week as pocket-money, and the balance of the wages earned by him will be paid by the farmer to the Government and placed to the boy's credit in the Treasury, being retained there at 4 per cent. interest per annum until the boy attains the age of 21 years, when the amount to his credit will be paid to him.

This provision for compulsory saving is considered to be an excellent one, as it will not only train the boy in thrift, but on attaining the age of 21 years he should have from £70 to £100 to his credit in the Treasury, and by transferring the amount to a Savings Bank account and adding to it from wages subsequently earned he would soon be in a position to attain his object in coming to the State, viz., to take up and work land on his own account (engaging in share-farming first), and in many cases, no doubt, he will be assisted in achieving this object by his original employer, who, having trained the boy, will take a life-long interest in him.

Clothing, Etc.

The Minister will have power to debit the boy's account in the Treasury with amounts due by him in connection with his passage to the State and outfit, and with the cost of clothing and other necessaries purchased by the boy with the approval of the Minister. All of the boys introduced will bring with them a complete outfit, and when any of the articles has to be replaced the boy will apply to his employer, who will forward a list for the approval of the Minister. Purchase from the storekeeper recommended in the application will then be authorised by the Minister, who will pay the account when rendered, debiting the boy's account in the Treasury with the amount. This arrangement will, it is considered, be more satisfactory than the original proposal that the clothes should be provided by the employer.

Control of Minister.

During the period of apprenticeship the Minister will have the care, control, and management of the boy. will see that he is properly treated, and that the wages are fair. On the other hand, he will have power to fine the boy for absconding or wilful negligence of his duties, and provision will be made for dismissing the boy if he is guilty of such misconduct as would justify a master in dismissing a servant.

Selection.

The Chief Immigration Agent in London has been instructed to exercise the greatest care in selection, so as to send only boys of good character, who will be capable of adapting themselves to work on the land. Only those who have indicated sterling worth and whose physique is beyond question will be brought out. The experience gained with the 91 lads who were introduced by the Government last year, and of whom only one has been reported as unsatisfactory, makes the department confident that good boys can be secured. They have shown that the British boy is quick, active, receptive, and hard-working.

THE FIRST PARTY.

It is desired that the first party of boys under this scheme should come to the State in the s.s. *Irishman*, which is expected to arrive at the Outer Harbor early in May next. It is unlikely that this party will comprise more than 50 boys, so it is important that farmers and producers desirous of securing them should, to avoid disappointment, apply at once.

As the Government wish the movement to become widely known, farmers and others receiving this circular are asked to discuss the subject with their neighbors, to whom circulars and forms can be forwarded on application.

ED. J. FIELD, Immigration Officer.

Crown Lands and Immigration Office,
Adelaide, January 27th, 1914.

Following is a copy of the form of agreement which the employer and the boy will be required to sign :—

Apprenticeship Agreement.

Memorandum of agreement made this................day of................19....., in pursuance of the Immigration Act Amendment Act, 1913, between ...., Commissioner of Crown Lands and Immigration for the State of South Australia on behalf of His Majesty the King (hereinafter called the ' Minister ") of the first part ....lately arrived in the State of South Australia (hereinafter called the " employé ") of the second part, and................of.................. (hereinafter called the " employer ") of the third part, whereby it is agreed by and between the parties as follows, that is to say :—

1. In consideration of the agreements hereinafter contained on the part of the Minister and the employé, the employer hereby agrees with the Minister and with the employé that he will employ the employé upon his ....situated at............for the term of...........years from the date of these presents at a wage of............shillings per week during the first four months, and ....shillings per week during the remaining eight months of the first year; ....shillings per week during the second year, and..............shillings per week during the third year: Provided that in respect of the period of harvest (any dispute as to the duration of which shall be determined by the Minister) the rate of wages shall be doubled. The wages shall be payable as follows :—The sum of two shillings and sixpence per week shall be paid to the employé for pocket-money, and the balance shall be paid monthly to the Minister or his appointee upon trust for the purposes hereinafter mentioned.

2. The employer, for the consideration aforesaid, hereby further agrees with the Minister and with the employé that he will during the said term teach the employé the business of................and maintain him with proper food, nourishment, and lodging, and treat him with consideration and humanity, and shall grant the employé reasonable facilities at least once on every Sunday to attend some place of divine worship according to the tenets of the religious persuasion in which the employé has been brought up, or which he professes, if there is any such place within three miles from the residence of the employer.

3. In consideration of the above agreement on the part of the employer and the agreement hereinafter contained on the part of the Minister, the employé hereby agrees with the Minister and with the employer that he, the employé, shall and will truly and faithfully serve the employer during the said term and conform to all his lawful and reasonable orders, and shall and will be honest, upright, and diligent in the discharge of his duties; and that during the said term the employer may pay all wages earned by the employé (with the exception of the sum of two shillings and sixpence per week hereinbefore mentioned) to

the Minister or his appointee; and that such wages (with the interest thereon) shall be held by the Minister or his appointee, and be applied firstly in the payment of the amount of ....which is hereby acknowledged to be due by the employé to the Minister in respect of moneys advanced and expenses incurred by the State on the employé's behalf before and (or) during his passage to the State and (or) after his arrival in the State: Secondly, in repaying any money advanced by any person, society, or association in the State or elsewhere towards the passage money of the boy, and (or) expended in providing him with an outfit for the purposes of his coming to the State: Thirdly, for the benefit of the employé when and in such manner as the Minister from time to time deems advisable; any balance (subject as hereinafter provided) to be paid to the employé upon his attaining the age of 21 years.

4. It is hereby further agreed that the employer shall, with the consent in writing of the Minister first had and obtained, have the right at any time during the said term, if the employé is guilty of such misconduct as would justify a master in dismissing a servant, or for any other reason which appears good and sufficient to the Minister, to dismiss the employé.

5. The employé hereby agrees to abstain from smoking cigarettes during the term of his apprenticeship.

6. The employé hereby further agrees that if the Minister is satisfied that the employé has been guilty of misbehaviour, or of wilful neglect of duty, it shall be lawful for the Minister, by writing under his hand, to forfeit any moneys held by the Minister on behalf of the employé, or any part of such moneys, and to apply all moneys so forfeited in manner provided by section 15 of the Immigration Act Amendment Act, 1913.

7. The employer hereby further agrees that he will not assign or transfer the employé or make over to any other person the services or care of the employé, without the consent in writing of the Minister first had and obtained.

8. It is hereby further agreed between the parties hereto that the Minister shall have power to appoint from time to time some person or persons who shall have authority to visit the employé at all reasonable times and to inquire as to whether he is being well treated, and as to whether the employer is abiding by the provisions of this agreement, and to report to the Minister thereon, and the employer shall not in any way interfere with any such person in the exercise of such authority, but shall allow him every facility necessary for the exercise thereof.

9. If at any time during the said term the employer fails to abide by the provisions of this agreement, or any of them, or is not properly treating the employé, or in any other case provided by the said Act, it shall be lawful for the Minister to terminate this agreement and to withdraw the employé from the service of the employer, and the employer shall have no redress or remedy whatever for such withdrawal or loss of service, and if the agreement is so terminated or otherwise becomes of no effect, the Minister may, by order in writing signed by him, require the employé forthwith to return to any place or institution to be named in the order, and the Minister may, by the same or a separate order, require the employer forthwith to deliver the employé to some person therein named.

10. The employer and the employé hereby severally further agree to abide by all the provisions of the Immigration Act Amendment Act, 1913, and of all regulations thereunder.

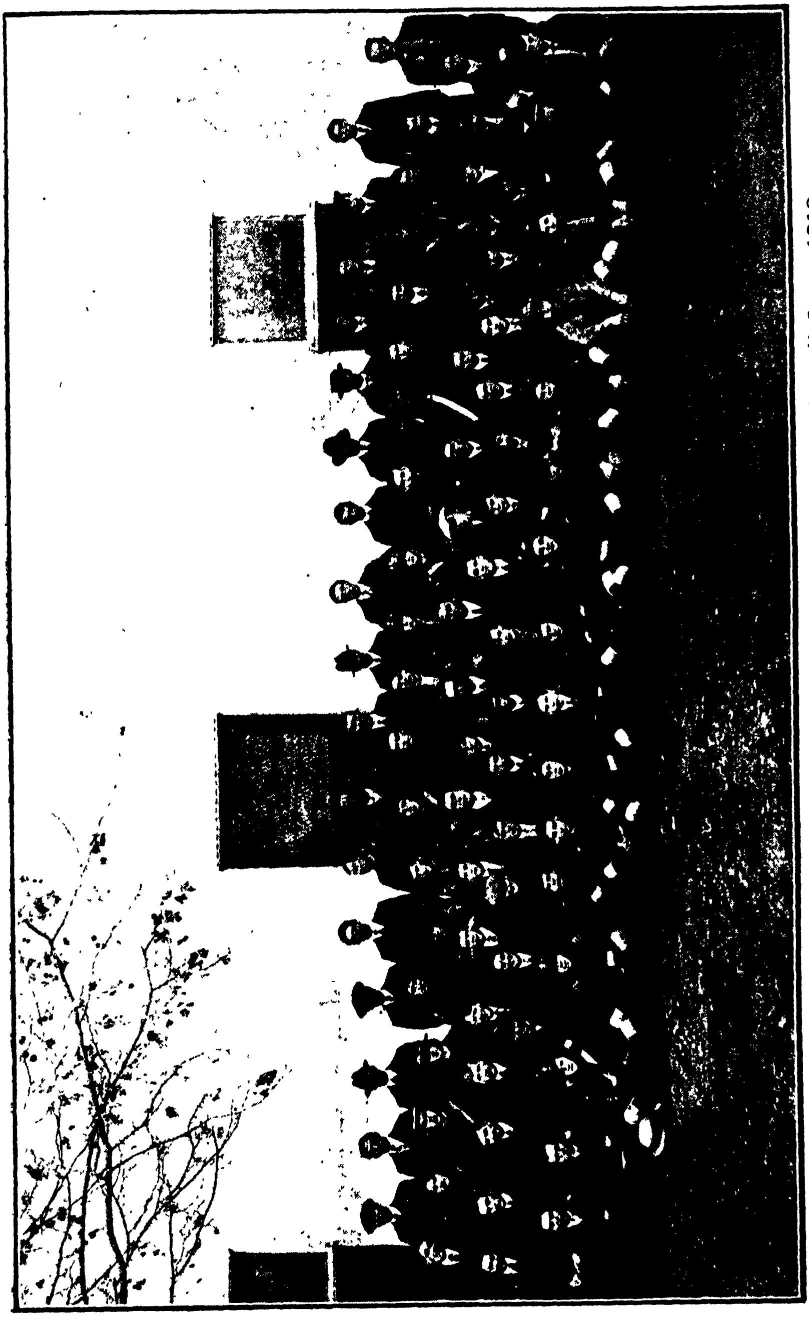
In witness whereof the parties hereto have hereunto subscribed their names on the day and year first above written.

Signed by the said..............on behalf of His Majesty the King, in the presence of } ....

Signed by the said ....in the presence of } ....

Signed by the said ....in the presence of } ....

Below will be found extracts from letters received by the Immigration Department from some of the employers, and also some of the 81 British lads who arrived in June last and were placed with farmers without apprenticeship. Nearly all the farmers add remarks testifying to the willingness of the lads and the satisfactory nature of their progress, especially in view of



Party of British Lads. Arrived South Australia per s.s. "Beltana," June, 1913.

their general ignorance of rural work on arrival. The boys correspond regularly with the department, and their letters show that British lads soon adapt themselves to the conditions of farm life.

EXTRACTS FROM FARM[illegible] TERS.

"The youth is proving a very useful lad."

"The youth seems to be a very good class of boy, and ought to do well here."

"I find the boy quick at learning, well behaved, and disciplined beyond the average boy of his age."

"He takes an interest in all his work."

"I can do with another of the same sort at any time."

"He is well mannered."

"He is a real good lad. He is well brought up, and is well liked by all my household and everyone around him."

"He is exceptionally keen and bright, and has proved himself quite capable of managing large teams. Moreover, he is well bred, and is a thorough gentleman. If the half-dozen young fellows around this locality are any indication of the rural youths available, they will be of great advantage to the country, and will do well themselves."

EXTRACTS FROM BOYS' LETTERS.

"I am quite satisfied with my work and prospects, and I hope that my fellow emigrants have as good masters as I myself have."

"I could not wish for a better place. I like the country very much, and I could not wish to be treated better than I am treated here."

"My employer is a perfect gentleman, and is quite willing to teach me as much as he can. So far he has treated me more like a brother than a hired laborer, which spirit is typical of the South Australians, as many as I have met."

"Mr. ——— is a very good master, and I have no fault to find with him, and anybody ought to be able to get on with him."

"The people are very kind to me, and treat me with every respect; not only that, I have all my meals with them, which I didn't think I should. I am in a comfortable place, and there is nothing to stop me from getting on and becoming a farmer within a few years—seven or eight. I am so glad I came out here, as I can see I am better off than I was in England. I hope all the other lads are as satisfied as I am. I mean to stick here as long as I can. I am getting on great with my governor and all."

"I am very satisfied with the work, and like the farming life very much. There is every chance of getting on in life if a lad is willing to work hard."

"I have been made exceedingly comfortable, and the people are very homely."

"I ask nothing better than to stop here until I am in a position to become my own master."

"I could not be with better people than who I am with. I am treated as if I was one of their own. Where they go I go with them, and what they have I have also. Although this is a dry year it does not make my governor cross towards me."

"I am very pleased indeed with my master and my work, and I have every prospect before me, owing to his kind words and great encouragement he is giving me, of bettering myself immensely."

"I have got a good home here, and the people I like very much, and I will try all I can to stop with them as long as my employer has got work for me."

"I am treated with proper care, and am very thankful to the Immigration Officer for putting me in such a decent place."

"In my first month's work I learned to ride and harness a horse, drive and milk cows Mr. ———— is a jolly nice man and has got patience with anyone, so it gives me encouragement to strive on, put my mind into my work, and make it a success."

"What I am learning about farming I like very much, and the life makes you strong and healthy. I have heard from my other two friends, and they say they have good people to work for, and they also like the work."

* * *

Haymaking.

FURTHER INVESTIGATIONS INTO FACTORS AFFECTING THE HANDLING OF WHEATEN HAY, INCLUDING A STUDY OF ITS DIGESTIBILITY.

By ARTHUR J. PERKINS, Principal Roseworthy Agricultural College; J. H. PHILLIPS, B.Sc., Agricultural Chemist; W. J. SPAFFORD, Assistant Experimentalist; and N. S. MAY, Assistant Analyst.

Last year we published the results of certain investigations into the nature and quality of wheaten hay, cut in various stages of development. These investigations, however, which were conducted during the 1911-12 season, were imperfect, to the extent that they were not conclusively closed by direct digestion tests on animals consuming the various samples of hay cut. Hence it was thought advisable to enlarge their scope in the season that followed. The provisional conclusions of the 1911-12 experiments may be summarised as follows :—

1. Maximum hay yields may be anticipated when the grain begins to enter upon the dough stage.
2. Hay cut in this stage of development is generally very dry and bleached, and carries an abnormal proportion of grain. We inferred for hay of this type a certain degree of indigestibility, although we had no experimental data to put forward in support of these impressions.
3. From the dough stage onwards a marked and progressively increasing reduction in the hay yield is very noticeable.
4. Hay of the highest feeding quality is secured when the crop is cut down with the grain at full size but in the milky stage.
5. The usual commercial standards for quality in wheaten hay—green color and shrivelled grain—were in our opinion amply justified.

THE 1912-13 EXPERIMENTS.

In the 1912-13 season we determined to repeat the earlier tests, and to complete them by direct digestion tests on horses. The 1911-12 experiments were limited to individual areas of one-hundredth of an acre, convenient because of the evenness in growth of the several cuts that came in for examination, but altogether inadequate if digestion tests were to follow at a later date. Hence, with a view to securing amply sufficient hay for the feeding of four horses over a period of 10 to 12 days, in 1912-13 the individual area of each cut of hay was raised approximately to half an acre. And although we carefully selected as evenly-grown a portion of a hay field as could be found, the larger areas that we were compelled to use have given rise in some instances to a certain degree of irregularity in yields which will be duly noted in the course of this report.

THE 1912-13 CUTS OF HAY.

At regular weekly intervals, seven successive cuts of hay were taken from a well-grown field of King's White wheat, starting with the field in full bloom, and closing with the grain practically ripe. Full details concerning these several cuts and their respective yields are shown below in Table I.

TABLE I.—*Showing Details of Seven Cuts of Hay taken between Full Bloom and Ripeness.*

No.	Area Cut.	Date Cut.	Remarks.	Quantity Cut.	Yield per Acre.	Moisture.
	Acres.			lbs.	Tons cwts. lbs.	%
A	0·5525	Oct. 10 .	One day after full bloom	2337	1 17 86	11·31
B	0·5400	Oct. 16 .	Grain ¼ to ⅓ of full size	2551	2 2 20	10·27
C	0·5300	Oct. 23 .	Grain nearly full size ; milky	2949·5	2 9 77	10·71
D	0·5375	Oct. 30 .	Grain full size ; still milky	3220	2 13 55	9·95
E	0·5762	Nov. 6 .	Crop just turning yellow ; grain in dough stage	3166·5	2 9 7	8·27
F	0·5112	Nov. 13	Grain firming ; very little green in crop	2910·5	2 10 93	7·53
G	0·5175	Nov. 20.	Crop white ; grain almost dry ripe	2816·5	2 8 67	7·20

It will be noted from the figures in Table I., which have been given graphic illustration in Fig. 1, that in the 1912-13 experiments the heaviest cut of hay was taken at the fourth cut, 20 days after full bloom, and at a time when the grain was still in the milky stage (Cut No. D). In 1911-12, on the other hand, the heaviest hay yield was taken at the fifth cut (Cut No. E), about 29 days after full bloom, and with the grain in the full dough stage. We have reason to believe that in normal conditions the 1911-12 results would have been repeated in 1912-13, and that for reasons that escape us, connected probably with some irregularity in growth, Cut No. E was abnormal in 1912-13. We assume, therefore, that in ordinary circumstances the graphic curve shown in Fig 1 would have followed the direction of the dotted, and not that of the full, line.

The last column in Table I. shows that hay cut rather on the green side retains on drying appreciably more moisture than hay cut on the ripe side.

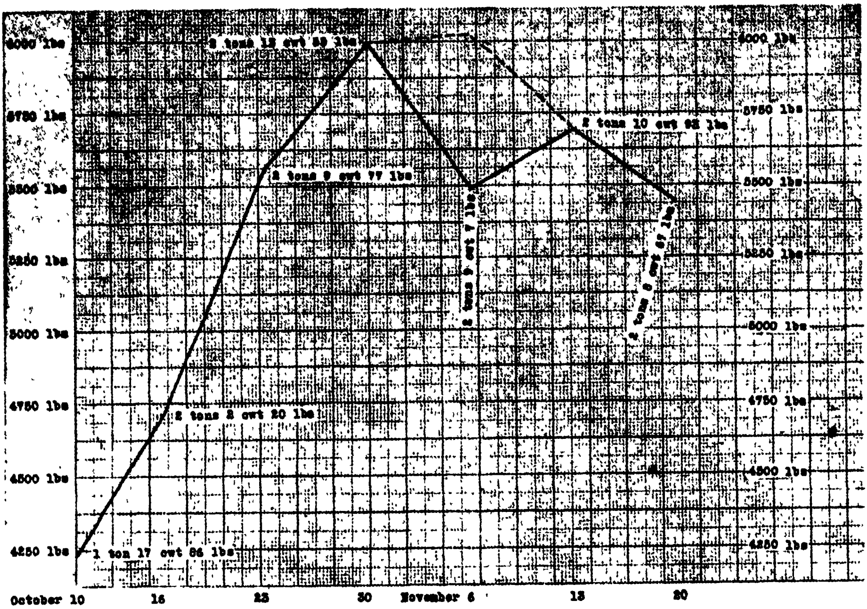


Fig 1 - Curve illustrating Table I and showing progressive rise and fall of Hay Yield as the Crop passes from Full Bloom to Ripeness of the Grain

EXTERNAL CHARACTERISTICS AND APPARENT QUALITY OF HAY CUT IN VARIOUS STAGES OF MATURITY.

In Table II. we have summarised a few notes on the general appearance and character of the several cuts of hay when they were found to be in condition for stacking. We have also indicated the loss of weight on drying for each cut.

TABLE II.—*Showing Character of each Cut of Hay when fit for Stacking, together with Loss of Weight on Drying.*

No.	Loss of Weight on Drying.	Descriptive Notes.
	%	
A	71·33	Very green in the straw; heads all bleached; empty shells in lieu of grain
B	61·32	Very green in color throughout; grain no more than skins
C	53·11	Good green color throughout; grain still no more than skins
D	47·37	Very attractive hay; green color throughout; grain almost full size but very much pinched
E	49·15	Pale-green in color; lower third of straw white; grain full size but pinched
F	33·63	Hay almost white, only traces of green being perceptible; grain good and fully developed
G	24·00	Hay brittle and white; grain good seeding sample

With reference to Table II., we wish merely to draw attention to the fact that although throughout the period under consideration—from full bloom to ripeness—the loss of weight of the hay on drying was on a progressively descending scale. There is an apparent anomaly in the case of Cut No. E, in which the loss of weight was greater than in Cut No. D immediately preceding it. This fact serves to confirm our impression that there was something abnormal in Cut No. E which at the time escaped our notice.

On the Relation between the Ears on the one hand, and the Culms and Flag on the other, in the Successive Cuts of Progressively Ripening Wheaten Hay.

In our earlier paper we succeeded in showing that the gradually increasing weight of the ears of ripening corn was gained very largely at the expense of the weight of the culms and flag. This implies that the material stored up in the ears is taken from the culms and flag, which are to that extent impoverished and reduced in value as feeding material. In other words overripe hay is ill-balanced hay, in which the valuable food materials are very unevenly distributed. This experiment was repeated in the course of the 1912-13 tests on the following lines :—From each cut of hay two typical sheaves were taken when the hay was judged to have reached stacking condition. These two sheaves were carefully weighed ; the ears were then carefully separated from the culms and weighed. The results of these data are summarised below in Table III. It should be stated that for the sake of comparison in Table III. all figures have been calculated on a basis of a hay going 10 per cent. of moisture throughout. In the earlier paper we adopted 15 per cent. of moisture as a standard. As the result of more numerous analyses, however, we are satisfied that normal hay under our conditions retains, as a rule, no more than 10 per cent. of moisture.

Table III.—*Showing Proportions respectively of Ears on the one hand, and Culms and Flag on the other, in several Cuts of Wheaten Hay cut in Varying Stages of Maturity, and calculated to a Uniform* 10 *per cent. Moisture Contents.*

No.	Culms and Flag.		Ears.		Percentage of Ears.
	In Two Sheaves.	Per Acre.	In Two Sheaves.	Per Acre.	
	lbs.	lbs.	lbs.	lbs.	%
A	11·618	3,657	1·623	511	12·26
B	11·188	3,995	2·000	714	15·17
C	11·028	4,468	2·600	1,053	19·08
D	15·056	4.515	4·933	1,479	24·68
E	14·134	3.665	7·463	1,936	34·56
F	12·767	3,680	7·527	2.169	37·09
G	12·709	3,400	8·268	2,212	39·41

The following conclusions may be derived from the results set out in Table III. :—

1. That for a period of 20 days after full bloom there is a perceptible increase in the total weight per acre of culms and flag ; and that the maximum increase at the fourth cut is close on 23½ per cent. of the original weight at full bloom.

2. That after 20 days there is a gradual decrease in the total weight of culms and flag, and that when the grain is ripe the weight of culms and flag is actually less than was the case when the plants were in full bloom. The fall of the flag is no doubt partly accountable for these results. There are, however, other factors to be taken into consideration, as we shall have occasion to see later on.

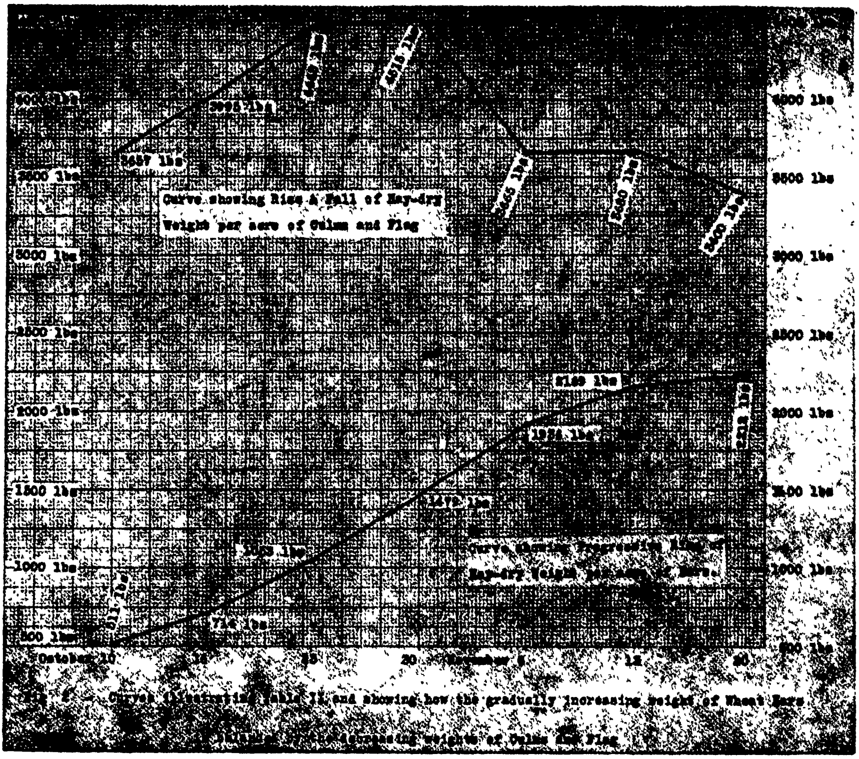


Fig. 2. — Curves illustrating Table II. and showing how the gradually increasing weight of Wheat Ears [illegible] decreasing weights of Culms and Flag.

3. That the increase in weight per acre of the ears is, on the other hand, on a progressively rising scale from full bloom to ripeness of the grain, and that throughout this period this increase in weight is always in excess of that of the culms and flag, as is indicated in the last column of Table III. by the gradually increasing percentage which the weight of the ears bears to that of the total hay in each successive cut. Thus, whilst in hay cut at full bloom the proportion of ears was about 12¼ per cent, this proportion had attained

to close on 25 per cent. 20 days after, and to close on 40 per cent. when the grain was ripe. These facts have been given graphic illustration in Fig. 2.

We may note in this connection that here again the anomalous character of Cut No. E is brought into relief. In this cut the weight of culms and flag per acre is less than that of Cut No. F, immediately following it, whereas the weight of ears is apparently normal. This would have the effect of rendering the percentage of ears in the fifth cut rather too high. We must infer, therefore that the abnormal features in this cut are probably connected with the average height of its culms, or with the proportion of flag which it carried.

CHEMICAL COMPOSITION OF WHEATEN HAY CUT IN VARIOUS STAGES OF MATURITY.

Within certain limits it is possible, by means of chemical analysis, to pronounce on the probable value of any given foodstuff ; and in this connection it is customary to separate the various constituents of the foodstuff under several headings. In the first place the water contents are ascertained, and this gives us water on the one hand and dry matter on the other. Thus a ton of hay going 10 per cent. of moisture would contain 2,016lbs. of dry matter, the balance being water. The dry matter itself may in the first instance be split up into mineral matter, or ash, on the one hand, and into organic matter, or combustible matter, on the other. Mineral matter may on the whole be considered of secondary importance in most foodstuffs, although it is naturally essential to the building up of the bony skeleton of young and growing animals. At the same time an excess of mineral matter such as is met with in immature vegetable growth is apt to lead to scouring and digestive troubles.

In all foodstuffs, on the other hand, the quality and composition of the organic matter must be looked upon as of the greatest importance. This organic matter it is customary to split up on the following lines :—(1) Proteins, or nitrogenous organic matter, regarded as the chief flesh-building material of the foodstuff ; (2) fat ; (3) carbohydrates ; and (4) fibre ; all of which, to the extent that they are actually digestible—a point which we shall have to consider later on—provide the fuel which keep the animal's vital functions going and contribute towards the building up of reserves of animal fat.

The chemical analysis of the several cuts of hay on these lines are indicated below in Table IV. It will be noted that in these figures separate data have been given for ears on the one hand, and for culms and flag on the other. This has been done in order to bring out more clearly the gradual enriching of the former at the expense of the latter.

Table IV.—*Showing Centesimal Composition in terms of Oven-dried Material of Ears on the one hand, and of Culms and Flag on the other, in Hay cut in Various Stages of Maturity.*

No.	Mineral Matter.		Organic Matter.		Proteins.	
	Ears.	Culms and Flag.	Ears	Culms and Flag.	Ears.	Culms and Flag.
	%	%	%	%	%	%
A	7·25	7·88	92·75	92·12	11·86	4·56
B	7·16	7·10	92·84	92·90	11·99	4·38
C	6·42	6·46	93·58	93·54	12·99	3·94
D	6·07	7·08	93·93	92·92	11·16	4·38
E	5·71	5·70	94·29	94·30	8·84	1·84
F	6·01	6·95	93·99	93·05	9·23	1·66
G	4·83	6·43	95·17	93·57	9·71	2·28

No.	Fat.		Carbohydrates.		Fibre.	
	Ears.	Culms and Flag.	Ears.	Culms and Flag.	Ears.	Culms and Flag.
	%	%	%	%	%	%
A	1·16	0·64	49·66	54·38	30·07	32·54
B	1·14	1·00	52·66	55·66	27·05	31·86
C	1·10	0·90	55·22	56·42	24·27	32·28
D	1·10	0·94	63·06	53·90	18·71	33·70
E	1·00	0·70	67·77	57·32	16·68	34·44
F	1·16	0·60	71·39	51·59	12·21	39·20
G	1·10	1·10	71·34	48·12	13·02	42·07

We may draw the following inferences from the results in Table IV. :—(1) There is practically no difference between the percentages of mineral matter, and consequently between the percentage of organic matter also, in the ears on the one hand, and in the culms and flag on the other. (2) In both there is a gradual decrease in the percentage of mineral matter and a corresponding increase in the percentage of organic matter as maturity progresses, although there is an apparent increase in mineral matter in culms and flag in the last fortnight, which may be attributed to the wasting away of the flag. (3) The percentage of proteins in the ears is from three to four times that present in the culms and flag. (4) The percentage of protein, in both ears on the one hand and in culms and flag on the other, ascends gradually until 20 to 15 days after full bloom; thereafter it shows a perceptible decrease. (5) The fat percentages are fairly stationary, and generally higher in the ears than in the culms and flag. (6) In the ears the carbohydrates, as might be expected in the starchy grain, rise steadily from full bloom to ripeness. At full bloom they are represented by about 50 per cent. of the weight of the dry matter in the ears, and by close on 72 per cent. when the grain is ripe. (7) In the culms and flag the carbohydrates increase slightly in the first fortnight after full bloom; thereafter they are more or less stationary until the last fortnight in the ripening stage, when a distinct decline is noticeable. (8) In the ears the proportion of fibre declines steadily from full bloom to ripeness. It is represented by 30 per cent. at full bloom time and declines to 13 per cent. when the grain is ripe. (9) Conversely, in culms and flag there is a steady increase in fibre from full bloom to ripeness. The proportion is about 32 per cent. of the dry matter at full bloom and 42 per cent. when the grain is ripe.

Distribution to the Acre of Constituent Parts of Wheaten Hay cut in Various Stages of Maturity.

In order to follow out more closely the changes which advancing maturity gradually brings about in wheaten hay, we shall consider next, for each cut, the distribution to the acre of the several constituent parts. These figures have been summarised below in Table V. :—

Table V.—*Showing Distribution per Acre of Constituent Parts of Wheaten Hay cut in Various Stages of Maturity.*

No.	Mineral Matter.	Organic Matter.	Proteins.	Fat.	Carbo-hydrates.	Fibre.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
A	292·69	3458·71	204·62	26·39	1209·28	2018·20
B	301·35	3937·65	234·60	43·29	1319·62	2340·14
C	320·62	4648·28	281·59	46·62	1528·02	2792·07
D	368·50	5026·10	326·55	51·50	1618·40	3029·64
E	287·51	4753·39	214·71	40·51	1426·68	3071·50
F	347·50	4916·60	235·18	42·52	1536·56	3102·33
G	292·92	4757·88	263·05	55·56	1546·63	2892·65

In examining the results tabulated in Table V. we must set aside those having reference to Cut No. E, which, as has already been pointed out, is more or less abnormal. If we bear this in mind, we shall notice as we pass from one cut to another that there is a steady increase per acre at every stage all along the line down to Cut D inclusively, *i.e.*, for a period of 20 days after full bloom. This general increase should in all probability have extended to Cut No. E, taken 26 days after full bloom. In the last fortnight of ripening, however, there is an evident decrease in all the constituents ; a loss, in fact, of dry matter to which we drew attention last year, and which we propose considering in detail in the light of the new figures now supplied.

LOSS OF DRY MATTER IN THE LAST STAGES OF THE RIPENING OF THE GRAIN.

We now propose discussing the causes of the loss of dry matter observed in the last fortnight of the development of the wheat plant. The total quantity of dry matter was represented on October 30th by 5,394·6lbs. to the acre (Cut No. D); and we have reason to suppose that this apparent maximum should have been exceeded in the next cut (Cut No. E). This cut, as has already been repeatedly stated, was abnormal, and showed instead an unexpected decrease of total dry matter, which must tend to hamper our calculations in this connection. On November 20th, with the grain practically ripe, we find the total dry matter represented by 5,050·8lbs. to the acre (Cut No. G)—an appreciable falling away from the results of Cut No. D, which, in the circumstances, we are compelled to take as the maximum cut of the series. [illegible] position may therefore be set out as follows:—

	lbs.
No. D (apparently maximum cut)	5,394·6
No. G (grain ripe)...............	5,050·8
Loss of dry matter per acre	343·8 or 6·41 per cent.

This loss—6·41 per cent. of maximum quantity of dry matter noted—is considerably below that noted in 1911-12, which amounted to 22·9 per cent. In the latter case, however, Cut No. E was normal and yielded a heavier quantity of dry matter than Cut No. D.

This loss of dry material, which characterises the ripening off of the wheat crop, must be set down to several factors, the chief of which would appear to be the fall of the exhausted flag. In our earlier paper we pointed out as additional contributing causes the shaking out of grain and other accidental losses, the weakening or suspension of assimilation, which would lead to the burning up of reserve organic material in the respiratory function without the compensation, or with only inadequate compensation, of new supplies; and occasionally the leaching action of rain on the dry porous material. We also pointed out that if these were to be considered the sole factors responsible for the disappearance of dry matter in the ripening process, then the loss of organic matter should be greater, or at all events not less than that of mineral matter. Our 1911-12 results showed that such was not the case, and our 1912-13 results support them. Thus, in 1912-13—

	lbs.
Total loss of dry matter	344·00 or 6·41 per cent.
Loss of organic matter	268·42 or 5·34 per cent.
Loss of mineral matter	75·58 or 20·51 per cent.

Thus, then, the proportional loss of mineral matter is considerably greater than that of organic matter. From another point of view: If we suppose the whole loss—344lbs.—to be represented by the fall of the flag, and take the average mineral composition of the latter to be 6·36 per cent. of the dry matter—the average of the last three cuts—the total loss of mineral matter should have been represented by 21·88lbs. instead of 75·58lbs. as indicated above. The inference, therefore, appears irresistible that as maturity progresses there must be a distinct migration of the mineral matter from the culms and flag to the roots. This is the solution that appeared to us to arise from our 1911-12 results; and we see it confirmed in the 1912-13 results.

ON THE LOSS OF DRY MATTER THAT TAKES PLACE DURING THE CURING PROCESS OF WHEATEN HAY.

When a more or less green crop of wheaten hay is cut and thrown into stooks it gradually dries, losing weight the while to an extent that varies with the stage of ripeness which the crop has attained to. Below, in Table VI., we have indicated what were the losses in weight of hay cut in various stages of maturity between full bloom and ripeness.

TABLE VI.—*Showing Loss of Weight on Drying of Wheaten Hay cut in Various Stages of Growth.*

No.	Weight of 40 Sheaves.		Loss of Weight on Drying.	
	Fresh Cut.	Hay-dry.	Total.	Percentage.
	lbs.	lbs.	lbs	%
A	835·96	238·96	597·0	71·41
B	643·96	248·46	395·5	61·42
C	633·46	296·46	337·0	53·20
D	740·96	389·46	351·5	47·44
E	766·96	389·46	377·5	49·22
F	609·96	404·46	205·5	33·69
G	521·96	396·46	125·5	24·04

It will be noted, therefore, that whilst very green hay, cut at full bloom time, will lose on drying close on three-quarters of its original weight, wheat with the grain ripe does not lose more than about one-quarter of its original weight. Average wheaten hay of good quality, on the other hand, cut between a fortnight and three weeks after full bloom, will on drying lose about one-half of its original weight.

These losses in weight correspond no doubt, for the most part, to losses of water, given off from the slowly-drying plant tissues. There is, however, a loss of another order to be taken into consideration (less striking, perhaps, than that of water, but of importance nevertheless from the point of view of the quality of the hay) and that is the loss of organic matter which always accompanies the slow death of living matter from which the water necessary to its continued existence is being gradually withdrawn. It is, perhaps, unnecessary to point out that when the sheaf is cut and bound its green tissues consist of an agglomeration of living cells, each independent one of the other, and each continuing to breathe normally so long as a sufficiency of moisture continues within its reach. In this breathing process, or respiration, organic matter is burnt up and expelled from the plant tissues in the form of water and carbon dioxide. Hence in the drying and curing process of hay there must be waste and loss of organic matter, which represents so much fuel burnt up and not replaced by new material supplied by the energies of the normally growing plant. Chemical changes, too, of another order also accompany what may be termed the dying agonies of the living matter. It may be said that the violent changes so characteristic of the ensilage pit, in which the drying-off process is practically inhibited, are repeated on a smaller and less conspicuous scale in the hay field; and they represent essentially what is known as the curing of the hay, a process which is generally supposed to enhance its feeding value. We thought that it would be interesting to ascertain the extent of these changes under our special conditions of climate. And although our experiments in this direction are far from conclusive, and on the whole elementary in character, we give them for what they are worth, with the statement that we intend investigating this question far more fully as soon as circumstances permit.

We indicate below in Table VII. the difference in chemical composition of the same sample of hay (Cut No. C) in the one instance oven-dried and analysed immediately after cutting, and in the other analysed after the usual field-drying process.

TABLE VII.—*Showing Chemical Composition of* (1) *Wheaten Hay Oven-dried immediately after cutting, and of* (2) *Wheaten Hay analysed after ordinary Field-drying Process.*

	Oven-Dried Sample. %	Field-Dried Sample. %		Oven-Dried Sample %	Field-Dried Sample. %
Mineral matter	6·63	6·91	Fibre	28·02	28·36
Organic matter	93·37	93·09	Carbohydrates	58·42	57·84
Proteins	6·13	6·13	Moisture	58·95	11·99
Fat	0·80	0·76			

In the above table all figures are expressed in terms of oven-dried material, and are therefore strictly comparable one with the other. It will be observed in the first place that there is an apparent increase in the mineral matter of the field-dried sample, and a corresponding decrease in organic matter. These facts are in accord with what might have been expected, *i.e.*, that there should have been a certain amount of waste of organic matter during the slow field-drying process. The figures in Table VII., however, do not convey an accurate idea of the amount of waste that has taken place, since on the one hand we have the analysis of material in which no waste has taken place, and on the other the analysis of material which is known to have undergone waste. We submit provisionally that the actual waste may be determined by the following considerations, a fact which we hope to verify as soon as circumstances permit.

We base our determinations on the fact that whilst in the field-drying process there must be loss of organic matter there can be no less of mineral matter so long as the weather continues dry. The mineral matter, therefore, remaining constant, must show an apparent increase in the analysis of material which has undergone waste of organic matter in the field-drying process. If, then, 6·63lbs. represents the quantity of mineral matter originally present in 100lbs. of the dry matter of the freshly-cut hay, and 6·91lbs. the quantity of mineral matter in 100lbs. of the dry matter of the same hay after field drying, and x the loss of organic matter per 100lbs. of dry matter originally present, then the following ratio is true, and from it we may determine the loss of organic matter that took place during the field drying, together with its distribution among the component parts of the hay :—

6·91 : 100 :: 6·63 : 100—x.

The working out of this ratio gives a value of 4·05 per cent. to the loss of dry matter arising during the course of field drying, or of 1·66 per cent. of the original green hay containing 58·95 per cent. of moisture. In Table VIII. we have indicated what is the distribution of this loss, basing the results on the data set out above in Table VII.

TABLE VIII.—*Showing the Calculated Distribution of the Loss of Organic Matter accompanying ordinary Field-Drying of Wheaten Hay.*

	Composition of Green Hay at the Time of Cutting.		Calculated Composition of Green Hay from Analysis of Field-Dried Sample.		Loss of Dry Matter in Field-Drying Process.	
	Per Ton. lbs.	Per cent.	Per Ton. lbs.	Per cent.	Per Ton. lbs.	Per cent.
Moisture	1320·48	58·95	1320·48	58·95	—	—
Dry matter.....	919·52	41·05	882·28	39·39	37·24	1·66
Mineral matter .	60·96	2·72	60·96	2·72	—	—
Organic matter .	858·56	38·33	821·32	36·37	37·24	1·66
Proteins	56·37	2·52	54·08	2·41	2·29	0·11
Fat	7·36	0·33	6·71	0·30	0·65	0·03
Fibre	257·65	11·50	250·22	11·17	7·43	0·33
Carbohydrates .	537·18	23·98	510·31	22·78	26·87	1·20

Thus, then, it will be seen, if our premises are granted, that 1 ton of green hay loses in field-drying, over and above moisture evaporated, 37¼lbs. of dry matter, or 1·66 per cent. of its original weight. Over seven-tenths of this loss is represented by carbohydrates, the balance being distributed among fibre, proteins, and fat, in order of importance.

We are quite aware that these data are based on an indirect treatment of the question, and that as such it calls for experimental confirmation, which we propose giving to it in the near future. The direct method, on the other hand, presents in our experience almost insuperable difficulties, unless confined to extremely small quantities of material. The chief difficulty is connected with the exact moisture determination of the sample at the time of bulk field-weighing. Under our conditions of climate, losses of moisture from plants recently cut is exceedingly rapid in the field, and it is almost impossible to guarantee that the moisture contents in the laboratory sample corresponds exactly to that of the bulk field sample at the time of weighing. Another difficulty is the prevalence of dust storms during the drying process of the hay, with the result that the field weight of the dried hay is generally in excess of what it should be. It may be added that all our last season's attempts at a direct determination of the problem failed for these and other reasons. We do not quote the results, as they were purely negative in character. At a later date we hope to be in a position to bring up more satisfactory results.

ON THE DIGESTIBILITY OF WHEATEN HAY.

It will be evident that the value of wheaten hay as a foodstuff will depend very largely on its relative digestibility, *i.e.*, on the extent to which animals consuming it would be able to make use of it in building up their tissues and giving effect to their various vital functions. This digestibility, it appeared to us, would probably vary with the state of ripeness attained to by the crop when the hay was cut; and to these variations should correspond similar variations in the commercial value of the hay. We determined, therefore, to attempt the solution of this problem on the seven cuts of hay that have been occupying our attention.

Definition of "Digestibility."

In principle the digestible portion of a foodstuff is that portion of it which passes into the animal economy, taking the form of reserve tissues, or else reappearing in the form of urine, sweat, breath, &c., whilst the undigested portion of the foodstuff is that portion of it which is voided from the body in the form of solid excreta. In order, therefore, to determine the digestibility of any foodstuff, one must compare the foodstuff itself, both quantitatively and qualitatively, with the solid excreta voided. The difference between the two represents material digested.

Mode of Procedure.

We shall first describe our mode of procedure, which was repeated seven times in experiments extending between February 10th and April 23rd.

We selected for the purpose four draught horses, two of which were three-year-old fillies, and two geldings five years old They were known respectively by the following names, which we shall make use of in connection with the data collected:—Fillies—Katrine and Lomond; geldings—Laird and Kyby.

Each one of these seven tests, during the course of which chaffed wheaten hay of varying degrees of maturity was fed to the four horses, extended over six complete days of 24 hours, starting from 7 a.m. of the first day and closing at 7 a.m. of the seventh day. Each test, too, was separated from the one immediately preceding it by an interval of four days, during which the horses were fed exclusively on the type of chaff to be experimented upon in the following six days. In other words the horses were fed on each of the seven types of chaff for successive periods of 10 days, the last six of which were availed of for direct digestion experiments. During the course of these experiments the horses were confined to open loose boxes, provided with impermeable sloping brick floors, and specially built mangers, from which the chaff supplied could not be nosed out by the animals. These boxes were built under an ordinary open shed, facing the south-west, and were therefore amply ventilated.

The horses were fed six times in the 24 hours with quantities of chaff which varied with their individual abilities to clean up the mangers. A sample of chaff was kept back for analysis from each feed supplied. Once in 24 hours feeding residues were swept out of the mangers, weighed, and sampled for analysis. The analysis of these residues for moisture is always essential, since their moisture contents are always greater than that of the chaff supplied, and their apparent weight, therefore, in excess of their true chaff weight. An attendant was on duty watching the horses day and night. It was his immediate duty carefully to sweep up the solid excreta as soon as they were voided. These excreta were kept in closed tins, and weighed and sampled for analysis every 12 hours. Every precaution was taken to avoid contamination by urine. The floors were carefully hosed down every time urine was passed by the animals.

The horses were led to water four times in the 24 hours, and weighed over the weighbridge once daily. They were groomed twice daily, but in the circumstances of the experiment could not be provided with bedding. In each period of six days the horses were without exercise beyond the daily stroll to the weighbridge, and no doubt they felt the lack of it. This, however, was without appreciable influence on their general health, and throughout the experimental periods they showed a tendency to put on flesh. During the four days' intervals that separated each test, the horses were securely muzzled and allowed to roam over a bare field, returning to their boxes for feeding purposes.

GENERAL HEALTH OF THE HORSES DURING THE EXPERIMENTS.

Throughout these experiments the horses were under the immediate supervision of Mr. F. E. Place, B.V.Sc., M.R.C.V.S., who, *inter alia*, reports that all four were in normal health and condition throughout the 70 days covered by the experiments. He adds that pulse, temperature, and excretory functions were normal, with the one exception of the gelding Laird, who was taken with an attack of colic during the digestion test bearing on hay sample No. B. The symptoms were those of impaction of the cæcum, and in Mr. Place's opinion the colic was attributable to the presence of sclerotomata, and not to the character of the food supplied. On the whole this slight accident to one horse, which did not go beyond a single day, is in our opinion without material influence on our results.

In the fourth experimental period (hay sample No. D) all four horses discharged a certain number of worms which Mr. Place identified as *Ascaris megalocephala* and *Oxyuris curvula.* These continued to appear spasmodically, and to a less degree in later feedings. Mr. Place attributes the discharge of these worms to the generally improving tone and condition of the horses.

GENERAL BEHAVIOUR OF THE HORSES DURING THE EXPERIMENTS.

On the whole, from the point of view of these experiments, the general behaviour of all four horses was good. The gelding Laird was very quiet and contented throughout. The gelding Kyby, on the other hand, was very fidgety and nervous, being constantly on the move, and often refusing to lie down at night. According to Mr. Place he probably missed his bedding. This did not, however, interfere with his feeding capacities, which were considerable. The filly Lomond was generally quiet and contented. The filly Katrine was rather restless in the earlier periods covering hay samples Nos. G, F, and E, but settled down in the later periods affecting hay samples D, C, B, and A. Both geldings were voracious feeders. The fillies, less used to confinement, perhaps, were smaller eaters and more difficult in their tastes.

We append below in tabular form a statement showing the average length of time each horse lay down during the 42 days they were under observation.

TABLE IX.—*Showing Average Length of Time the Horses lay down at Night during the course of the Experiments.*

Hay. Sample No.	Average of Six Nights.			
	Laird.	Kyby.	Lomond.	Katrine.
A	1 hour 47mins.	1 hour 7mins.	4 hours 41mins.	4 hours 54mins.
B	1 " 9 "	0 " 51 "	5 " 2 "	5 " 22 "
C	1 " 5 "	0 " 51 "	5 " 5 "	4 " 33 "
D	0 " 54 "	0 " 21 "	4 " 36 "	4 " 29 "
E	0 " 49 "	0 " 4 "	4 " 42 "	4 " 19 "
F	0 " 30 "	0 " 24 "	4 " 54 "	5 " 35 "
G	0 " 27 "	0 " 20 "	5 " 56 "	5 " 12 "
Means for 42 days	0 " 57 "	0 " 34 "	4 " 59 "	4 " 55 "

It will be noted that whilst the fillies took a moderate amount of rest, the two geldings lay down only to a very limited extent during the 42 days of the experiments.

EXPERIMENT I.—THE DIGESTIBILITY OF WHEATEN HAY CUT IN FULL BLOOM (OCTOBER 10TH). HAY SAMPLE NO. A.

It should be stated that in these digestion tests, which extended from February 10th to April 23rd, we started with the ripest hay (sample No. G) and closed with the greenest one (sample No. A), the one at present under consideration. We thought it advisable to follow this course, lest the greener hay should have had a scouring influence on the animals, which might have influenced the results of later feeding operations with maturer hays. In submitting the data, however, we have thought it better to proceed from the greenest to the ripest hay.

In Table X. below, we indicate in the first instance the general analysis of the early-cut hay consumed, together with that of the solid excreta of the four horses fed on it exclusively for a period of 10 days. The analysis of the excreta, however, refers to excreta voided in the last six days only of the experiment.

TABLE X.—*Showing General Analysis of Wheaten Hay cut at Full Bloom, and of the Solid Excreta of Four Horses fed exclusively thereon. Results expressed in terms of Oven-dried Material.*

	Moisture.	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	%	%	%	%	%	%
Hay	10·32	7·14	92·85	7·35	30·62	54·89
Solid excreta—						
Laird	79·05	11·50	88·50	6·39	36·00	46·11
Kyby........	80·10	11·99	88·01	6·21	35·52	46·28
Lomond	83·14	12·14	87·86	6·56	35·69	45·61
Katrine	80·85	11·77	88·23	6·56	34·89	46·78

It will be noted that in the above table we have grouped together carbohydrates and fat. We were driven to this arrangement by the large proportion of substances other than fat—chiefly digestive secretions—that enter into the ether extract of the excreta. So great, indeed, was the proportion of these foreign bodies that it completely masked the digestibility of the small proportions of fat usually present in wheaten hay. On the whole, however, the quantity of digestible fat is so small in wheaten hay that the arrangement adopted will not interfere materially with our results.

We append below in Table XI. the quantitative distribution of the constituents indicated by analysis in both the hay consumed and in the excreta voided in a period of six days. We have also indicated the quantities actually digested by the horses over the same period of time.

TABLE XI.—*Showing Quantitative Distribution of Constituents in Wheaten Hay cut at Full Bloom, and Consumed by Four Horses in six days, and those of Excreta derived therefrom, together with Digestibility of these Constituents.*

	Quantities Consumed or Voided.	Dry Matter	Mineral Matter	Organic Matter	Proteins.	Fibre.	Carbohydrates and Fat.
	lbs.	lbs.	lbs.	lbs.	lbs	lbs.	lbs.
Laird—							
Hay consumed .	216·57	194·21	13·87	180·34	14·27	59·47	106·60
Excreta voided .	416·87	87·35	10·05	77·31	5·58	31·45	40·28
Digested	—	106·86	3·82	103·03	8·69	28·02	66·32
Kyby—							
Hay consumed .	217·06	194·66	13·90	180·76	14·31	59·60	106·85
Excreta voided .	457·75	91·09	10·92	80·17	5·66	32·35	42·16
Digested	—	103·57	2·98	100·59	8·65	27·25	64·69
Lomond—							
Hay consumed .	197·78	177·35	12·66	164·69	13·03	54·31	97·35
Excreta voided .	463·62	78·16	9·49	68·67	5·12	27·90	35·65
Digested	—	99·19	3·17	96·02	7·91	26·41	61·70
Katrine—							
Hay consumed .	189·90	170·32	12·16	158·16	12·52	52·15	93·49
Excreta voided .	416·75	79·82	9·39	70·43	5·24	27·85	37·34
Digested	—	90·50	2·77	87·73	7·28	24·30	56·15
Means per horse per day—							
Hay consumed .	34·22	30·69	2·19	28·50	2·26	9·40	16·85
Excreta voided .	73·12	14·02	1·66	12·36	0·90	4·98	6·48
Digested	—	16·67	0·53	16·14	1·36	4·42	10·37
		%	%	%	%	%	%
Mean coefficients of digestibility .	—	54·32	24·22	56·64	60·10	46·99	61·56

Albumenoid ratio.................... 1 : 10·9

In the above table attention should be concentrated on the coefficients of digestibility indicated in its last section. We may note that in hay cut at full bloom 54·32 per cent. of the total dry matter is digestible, 24·22 per cent. of the mineral matter, 56·64 per cent. of the organic matter, 60·10 per cent. of the proteins, 46·99 per cent. of the fibre, and 62·21 per cent. of the combined carbohydrates and fat. And if we assume a general moisture percentage of 10 for the hay, it means that, independently of the water, 48·89 per cent. of the weight of the hay consumed by horses is digested by them.

The albumenoid ratio is the ratio found to exist in any foodstuff between the digestible proteins on the one hand and the balance of the digestible non-nitrogenous organic matter on the other. In wheaten hay cut at full bloom we find this ratio to be 1 : 10·9, or what may be termed a fairly wide ratio. In reality this ratio should be slightly higher than the figures we have given, because of our inability to separate digestible fat from digestible carbohydrates, and to give to the former in the calculation of the ratio its true nutritive value. The proportion of fat present is so small, however, that the difference involved is not likely to be of much consequence.

For purposes of later comparison with the results of tests with maturer hays, we summarise below in Table XII. both the total and digestible constituents of hay cut in full bloom, per cent. and per ton, on the assumption that the hay in question retains 10 per cent. of moisture. This percentage of moisture in hay naturally varies with a variety of circumstances. In our experience, however, 10 per cent. represents fairly closely the general condition of good local hay.

TABLE XII.—*Showing Per Cent. and Per Ton Distribution of Total and Digestible Constituents of Wheaten Hay, cut in Full Bloom, and Retaining* 10 *per cent. of Moisture.*

	PER CENT.		PER TON.	
	Total.	Digestible.	Total	Digestible.
	%	%	lbs.	lbs.
Moisture	10·00	—	224·00	—
Dry matter	90·00	48·89	2016·00	1095·14
Mineral matter	6·43	1·56	144·03	34·94
Organic matter	83·57	47·34	1871·97	1060·42
Proteins	6·61	3·98	148·06	89·15
Fibre	27·56	12·95	617·34	290·08
Carbohydrates and fat	49·40	30·41	1106·56	681·18

Thus, then, in 1 ton of this description of hay digestible matter will be represented by about 1,095lbs., more than three-fifths of which is represented by carbohydrates and fat, and more than a quarter of which is fibre, and less than one-tenth protein.

APPARENT PALATABILITY OF HAY CUT IN FULL BLOOM.

As far as could be seen the horses did not appear to relish this hay. The mangers were cleared up less readily than was the case with any of the other types of hay.

EXPERIMENT II.—THE DIGESTIBILITY OF WHEATEN HAY CUT SIX DAYS AFTER FULL BLOOM (OCTOBER 16TH). HAY SAMPLE NO. B.

When this hay was cut the grain was already formed, and between one-quarter to one-third of the normal size. The hay dried very green, and the grain was reduced to mere skins.

The general analysis of this hay, together with that of excreta derived from it, is indicated below in Table XIII.

TABLE XIII.—*Showing General Analysis of Wheaten Hay cut Six Days after Full Bloom, and of the Solid Excreta of Four Horses exclusively fed thereon. Results expressed in terms of Oven-dried Material.*

	Moisture.	Mineral Matter.	Organic Matter.	Proteins.	Fibre	Carbohydrates and Fat.
	%	%	%	%	%	%
Hay	9·91	8·11	91·89	7·70	32·91	51·28
Solid excreta—						
Laird	78·59	9·56	90·44	6·30	37·58	46·56
Kyby........	80·21	10·21	89·79	5·85	38·34	45·59
Lomond	81·24	9·49	90·51	6·21	38·00	46·30
Katrine	80·31	9·52	90·48	6·04	37·96	46·38

In order to establish the "digestibility" of the food consumed, we have summarised below in Table XIV. data bearing upon six days' feeding by four horses on wheaten hay cut six days after full bloom.

TABLE XIV.—*Showing Quantitative Distribution of Constituents in Wheaten Hay cut Six Days after Full Bloom, and Consumed by Four Horses in Six Days, and of those in Excreta derived therefrom, together with the Calculated Digestibility of these Constituents.*

	Quantities Consumed or Voided.	Dry Matter.	Mineral Matter.	Organic Matter.	Proteins.	Fibre	Carbohydrates and Fat.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Laird—							
Hay consumed .	213·11	192·00	15·57	176·43	14 78	63·19	98·46
Excreta voided .	427·19	91·45	8·74	82·71	5 76	34·37	42·58
Digested	—	100 55	6·83	93 72	9 02	28·82	55 88
Kyby—							
Hay consumed .	218·06	196·46	15·93	180·53	15·13	64·66	100·74
Excreta voided .	467·56	92·52	9·45	83·07	5·42	35·47	42·18
Digested	—	103·94	6·48	97·46	9·71	29·19	58·56
Lomond—							
Hay consumed .	199·81	180·00	14·60	165·40	13 86	59·24	92·30
Excreta voided .	458·50	86·02	8·16	77·86	5·34	32·69	39·83
Digested	—	93·98	6·44	87·54	8·52	26·55	52·47
Katrine—							
Hay consumed .	211·09	190·19	15 43	174·76	14·64	62·59	97·53
Excreta voided .	483·37	95·18	9·16	86·02	5·75	36·13	44·14
Digested	—	95·01	6·27	88·74	8·89	26·46	53·39
Means per horse per day—							
Hay consumed .	35·08	31·61	2·56	29·05	2·43	10·40	16·21
Excreta voided .	76·53	15·22	1·48	13·74	0·93	5·78	7·03
Digested	—	16·39	1·08	15·31	1·50	4·62	9·18
Mean coefficients of digestibility. .	—	% 51·87	% 42·29	% 52·71	% 61·87	% 44·46	% 56·63

Albumenoid ratio...................... 1 : 9·5

We see, then, from Table XIV. that in wheat cut six days after full bloom there is a falling off in the digestibility of the dry matter of nearly 2½ per cent. when compared with that of wheat cut in full bloom; a falling off of over 2½ per cent. in the digestibility of the fibre; a falling off of nearly 5¼ per cent. in the digestibility of the carbohydrates and fat combined; but an increase of 1¾ per cent. in the digestibility of the proteins; and an unaccountable increase of 18 per cent. in the digestibility of the mineral matter.

Increase in the digestibility of the proteins and decrease in the digestibility of the carbohydrates and fat, has led to a slight narrowing in the albumenoid ration, which for wheat cut six days after full bloom becomes 1 : 9·5.

Below, in Table XV., we have, as for the preceding cut of hay, summarised the total and digestible constituents of hay cut six days after full bloom, in terms of hay retaining 10 per cent. of moisture, both as parts of 100 and parts of 1 ton.

TABLE XV. —*Showing Per Cent. and Per Ton Distribution of Total and Digestible Constituents of Hay cut Six Days after Full Bloom, and Retaining* 10 *per cent. of Moisture.*

	PER CENT.		PER TON.	
	Total.	Digestible.	Total.	Digestible.
	%	%	lbs.	lbs.
Moisture	10·00	—	224·00	—
Dry matter	90·00	46·68	2016·00	1045·63
Mineral matter	7·30	3·09	163·52	69·22
Organic matter	82·70	43·59	1852·48	976·64
Proteins	6·93	4·28	155 23	95·87
Fibre	29·62	13·17	663·49	295·01
Carbohydrates and fat	46·15	26·14	1033·76	585·54

PALATABILITY OF HAY.

With the exception of Laird, who was taken with colic, the horses appeared to take this hay very well.

EXPERIMENT III.—THE DIGESTIBILITY OF WHEATEN HAY CUT 13 DAYS AFTER FULL BLOOM (OCTOBER 23RD). HAY SAMPLE C.

When this hay was cut the grain was almost full size, and very milky. It dried out a good green color throughout, with the dried grains little more than skins. The general analysis of this hay, together with that of the excreta derived from it, it shown below in Table XVI,

TABLE XVI.—*Showing General Analysis of Wheaten Hay cut* 13 *Days after Full Bloom, together with that of the Solid Excreta of Four Horses exclusively fed thereon. Results expressed in terms of Oven-dried Material.*

	Moisture.	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	%	%	%	%	%	%
Hay	10·59	6·90	93·10	6·56	28·45	58·09
Solid excreta—						
Laird . .	77·54	9·74	90·26	5·60	38·77	45·89
Kyby.. . .	78·65	9·76	90·24	5·34	39·29	45·61
Lomond	79·59	9·05	90·95	5·34	39·16	46·45
Katrine . .	79·22	9·57	90·43	5·42	38·67	46·34

In Table XVII. the various data are arranged to show the digestibility of hay cut 13 days after full bloom when consumed by four horses for a period of six days.

TABLE XVII. *Showing Quantitative Distribution of Constituents in Wheaten Hay cut* 13 *days after Full Bloom, and consumed by Four Horses in Six Days, and of those in Excreta derived therefrom, together with Calculated Digestibility of these Constituents.*

	Quantities Consumed or Voided	Dry Matter.	Mineral Matter.	Organic Matter.	Proteins	Fibre.	Carbohydrates and Fat.
	lbs.	lbs	lbs.	lbs	lbs	lbs.	lbs
Laird—							
Hay consumed .	218·10	195·08	13·46	181·62	12·80	55·50	113·32
Excreta voided .	409·94	92·07	8·97	83·10	5·16	35·69	42·25
Digested	—	103·01	4·49	98·52	7·64	19·81	71·07
Kyby—							
Hay consumed .	218·44	195·31	13·48	181·83	12·81	55·57	113·45
Excreta voided .	428·31	91·46	8·93	82·54	4·88	35·94	41·72
Digested	—	103·85	4·55	99·29	7·93	19·63	71·73
Lomond—							
Hay consumed .	216·31	193·41	13·35	180·06	12·69	55·02	112·35
Excreta voided .	483·81	98·77	8·94	89·83	5·27	38·68	45·88
Digested	—	94·64	4·41	90·23	7·42	16·34	66·47
Katrine—							
Hay consumed .	216·62	193·69	13·36	180·32	12·71	55·10	112·51
Excreta voided .	448·50	93·19	8·92	84·27	5·05	36·04	43·18
Digested	—	100·50	4·44	96·05	7·66	19·06	69·33
Means per horse per day—							
Hay consumed .	36·23	32·40	2·24	30·16	2·13	9·22	18·82
Excreta voided .	73·77	15·65	1·49	14·16	0·85	6·10	7·21
Digested	—	16·75	0·75	16·00	1·28	3·12	11·61
Mean coefficients of digestibility ...	—	% 51·70	% 33·36	% 53·06	% 60·07	% 33·84	% 61·69

Albumenoid ratio.................... 1 : 11·5

Table XVII. shows that the digestibility of the dry matter of hay cut 13 days after full bloom does not differ much from that of hay cut six days after full bloom. The most salient differences are (1) a decrease in the digestibility of proteins, (2) an increase in the digestibility of carbohydrates, and (3) a marked decrease in the digestibility of fibre--a decrease of over 10 per cent. This decrease in the digestibility of proteins, accompanied by an increase in the digestibility of the carbohydrates, has led to the widening of the albumenoid ratio.

We show below in Table XVIII. the distribution of both total and digestible constituents in hay cut 13 days after full bloom, and retaining 10 per cent. of moisture.

TABLE XVIII. *Showing Per Cent. and Per Ton Distribution of Total and Digestible Constituents of Hay cut* 13 *days after Full Bloom, and retaining* 10 *per cent. of Moisture.*

	PER CENT.		PER TON.	
	Total.	Digestible.	Total.	Digestible.
	%	%	lbs.	lbs.
Moisture	10·00	—	224·00	—
Dry matter	90·00	46·53	2016·00	1042·27
Mineral matter	6·21	2·07	139·10	46·37
Organic matter	83·79	44·46	1876·90	995·90
Proteins	5·90	3·55	132·16	79·52
Fibre	25·60	8·67	573·44	194·21
Carbohydrates and fat	52·28	32·26	1171·07	722·62

APPARENT PALATABILITY OF THE HAY.

All four horses ate this hay very readily. It is perhaps worth noting that of all the seven samples under experiment, this is the only one from which absolutely no feeding residues were collected.

EXPERIMENT IV.--THE DIGESTIBILITY OF WHEATEN HAY CUT 20 DAYS AFTER FULL BLOOM (OCTOBER 30TH). HAY SAMPLE NO. D.

When this hay was cut the grain was fully developed, but still in the milky stage. On drying it formed very attractive looking hay, and green throughout. The grain was full size, but very much pinched.

The general analysis of this hay, together with that of the solid excreta derived from it, is shown below in Table XIX.

TABLE XIX.—*Showing General Analysis of Wheaten Hay cut 20 Days after Full Bloom, together with that of the Solid Excreta of Four Horses exclusively fed thereon. Results expressed in terms of Oven-dried Material.*

	Moisture	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	%	%	%	%	%	%
Hay	9·59	6·90	93·10	5·69	27·10	60·31
Solid excreta—						
Laird	76·96	9·87	90·13	5·34	37·75	47·04
Kyby........	77·29	10·42	89·58	5·34	38·23	46·01
Lomond	80·47	10·55	89·45	5·60	37·94	45·91
Katrine	78·29	9·61	90·39	5·51	38·12	46·76

We show below in Table XX. what proved to be the digestibility of this hay when fed to four horses for a period of six days.

TABLE XX.—*Showing Quantitative Distribution of Constituents in Wheaten Hay cut 20 Days after Full Bloom, and Consumed by Four Horses in Six Days, and of those in Excreta derived therefrom, together with the Calculated Digestibility of these Constituents.*

	Quantities Consumed or Voided.	Dry Matter.	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Laird—							
Hay consumed .	220·36	199·23	13·75	185·48	11·34	53·99	120·15
Excreta voided .	402·00	92·63	9·14	83·49	4·95	34·97	43·57
Digested	—	106·60	4·61	101·99	6·39	19·02	76·58
Kyby—							
Hay consumed .	221·24	200·02	13·80	186·22	11·38	54·20	120·63
Excreta voided.	427·69	97·12	10·12	87·00	5·19	27·13	44·69
Digested	—	102·90	3·68	99·22	6·19	17·07	75·94
Lomond—							
Hay consumed .	213·84	193·34	13·34	180·00	11·00	52·39	116·60
Excreta voided .	484·75	94·67	9·99	84·68	5·30	35·92	43·46
Digested	—	98·67	3·35	95·32	5·70	16·47	73·14
Katrine—							
Hay consumed .	219·19	198·17	13·67	184·49	11·28	53·70	119·51
Excreta voided .	444·62	96·55	9·28	87·27	5·32	36·80	45·15
Digested	—	101·62	4·39	97·22	5·96	16·90	74·36
Means per horse per day—							
Hay consumed .	36·44	32·95	2·27	30·67	1·87	8·93	19·87
Excreta voided .	73·29	15·87	1·61	14·27	0·86	6·03	7·37
Digested	—	17·08	0·66	16·40	1·01	2·90	12·50
Mean coefficients of digestibility ...	—	% 51·82	% 29·38	% 53·48	% 53·87	% 32·42	% 62·91

Albumenoid ratio.................... 1 : 15·25

Table XX. clearly indicates the influence of advancing maturity on the digestibility of hay. The digestibility of total dry matter remains sensibly the same as that observed for hay cut seven days earlier. The digestibility of the mineral matter, however, is reduced by about 4 per cent., that of the proteins by 6·20 per cent., and that of the fibre by about 1½ per cent. The digestibility of carbohydrates and fat combined shows an increase of about 1¼ per cent. The general result of these changes is that the albumenoid ratio is now 1 : 15·25, a very wide ratio, pointing to a considerable reduction in the general value of the hay as a foodstuff.

Finally, in Table XXI., we show the total and digestible constituents of hay cut 20 days after full bloom in terms of hay retaining 10 per cent. of moisture.

TABLE XXI. *Showing Per Cent. and Per Ton Distribution of Total and Digestible Constituents of Hay cut* 20 *Days after Full Bloom, and retaining* 10 *per cent. of Moisture.*

	PER CENT.		PER TON.	
	Total.	Digestible.	Total.	Digestible.
	%	%	lbs.	lbs.
Moisture	10·00	—	224·00	—
Dry matter	90·00	46·64	2016·00	1044·74
Mineral matter	6·21	1·83	139·10	40·99
Organic matter	83·79	44·81	1876·90	1003·74
Proteins	5·12	2·76	114·69	61·82
Fibre	34·39	7·91	546·34	177·18
Carbohydrates and fat	54·28	34·15	1215·87	764·96

APPARENT PALATABILITY OF THE HAY.

All four horses ate this sample of hay very readily.

EXPERIMENT V. -THE DIGESTIBILITY OF WHEATEN HAY CUT 27 DAYS AFTER FULL BLOOM (NOVEMBER 6TH). HAY SAMPLE NO. E.

When this hay was cut the crop was just beginning to yellow off, the grain being very distinctly in the dough stage. Later on, at stacking time, the general color of the dry hay was pale-green, the lower third of the culms, however, being more or less white; the grain was pinched.

The general analysis of this hay, together with that of the excreta derived therefrom is shown below in Table XXII.

TABLE XXII.—*Showing General Analysis of Wheaten Hay cut 27 Days after Full Bloom, together with that of the Excreta of Four Horses, exclusively fed thereon. Results expressed in terms of Oven-dried Material.*

	Moisture.	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	%	%	%	%	%	%
Hay	9·59	6·30	96·70	5·43	27·25	61·02
Solid excreta—						
Laird	75·39	10·60	89·40	4·90	37·24	47·26
Kyby........	75·61	10·82	89·18	4·73	37·92	46·53
Lomond	79·00	10·46	89·54	4·81	38·47	46·26
Katrine	77·17	10·17	89·83	4·81	38·90	46·42

And below, in Table XXIII., we have summarised data setting out the digestibility of hay cut 27 days after full bloom, when fed to four horses for a period of six days.

TABLE XXIII.—*Showing Quantitative Distribution of Constituents in Wheaten Hay cut 27 Days after Full Bloom, and Consumed by Four Horses in Six Days, and of those in Excreta derived therefrom, together with the Calculated Digestibility of these Constituents.*

	Quantities Consumed or Voided.	Dry Matter.	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	lbs.	lbs.	lbs	lbs	lbs.	lbs.	lbs.
Laird—							
Hay consumed .	222·03	200·73	12·65	188·08	10·90	54·70	122·49
Excreta voided .	408·69	100·58	10·66	89·92	4·93	37·45	47·53
Digested	—	100·15	1·99	98·16	5·97	17·25	74·96
Kyby—							
Hay consumed .	222·59	201·24	12·68	188·56	10·93	54·84	122·80
Excreta voided .	406·75	99·22	10·74	88·49	4·69	37·62	46·17
Digested	—	102·02	1·94	100·07	6·24	17·22	76·63
Lomond—							
Hay consumed .	211·57	191·28	12·05	179·23	10·39	52·12	116·72
Excreta voided .	453·19	95·19	9·96	85·23	4·58	36·62	44·03
Digested	—	96·09	2·09	94·00	5·81	15·50	72·69
Katrine—							
Hay consumed .	220·31	199·18	12·55	186·64	10·82	54·28	121·54
Excreta voided .	421·67	96·26	9·79	86·47	4·63	37·45	44·39
Digested	—	102·92	2·76	100·17	6·19	16·83	77·15
Means per horse per day—							
Hay consumed .	36·52	33·02	2·08	30·94	1·79	9·00	20·15
Excreta voided .	70·43	16·30	1·71	14·59	0·78	6·21	7·59
Digested	—	16·72	0·37	16·35	1·01	2·79	12·56
Mean coefficients of digestibility ...	—	% 50·63	% 17·59	% 52·85	% 56·24	% 30·93	% 62·33

Albumenoid ratio.................... 1 : 15·2

Relatively to hay cut a week earlier, hay cut 27 days after full bloom shows a reduction of 1 per cent. in the total dry matter digested. Appreciable decreases in the digestibility of both fibre and carbohydrates is also to be noted, as also a very marked decrease in the digestibility of the mineral matter. On the other hand the digestibility of the proteins appear to be higher. The albumenoid ratio undergoes no change.

In Table XXIV. we have summarised data showing both total and digestible constituents in wheaten hay cut 27 days after full bloom, and retaining 10 per cent. of moisture.

TABLE XXIV.—*Showing Per Cent. and Per Ton Distribution of Total and Digestible Constituents of Hay cut 27 Days after Full Bloom, and Retaining 10 per cent. of Moisture.*

	PER CENT.		PER TON.	
	Total.	Digestible.	Total.	Digestible.
	%	%	lbs.	lbs.
Moisture	10·00	—	224·00	—
Dry matter	90·00	45·57	2016·00	1020·77
Mineral matter	5·67	1·00	127·01	22·40
Organic matter	84·33	44·57	1888·99	998·37
Proteins	4·89	2·75	109·54	61·38
Fibre	24·52	7·59	549·25	170·02
Carbohydrates and fat	54·92	45·57	1230·21	767·20

APPARENT PALATABILITY OF HAY.

The two geldings ate this hay readily enough, whilst the fillies took to it fairly well.

EXPERIMENT VI.—THE DIGESTIBILITY OF WHEATEN HAY CUT 34 DAYS AFTER FULL BLOOM (NOVEMBER 13TH). HAY SAMPLE NO. F.

When the hay was cut in this stage the crop showed only slight traces of green, whilst the grain was beginning to firm. The hay dried out almost white in color, with the merest traces of green, nor was the grain to any extent shrivelled.

The general analysis of this hay, together with that of the excreta derived therefrom, is shown below in Table XXV.

TABLE XXV.—*Showing General Analysis of Wheaten Hay cut 34 Days after Full Bloom, together with that of the Excreta of Four Horses exclusively fed thereon. Results expressed in terms of Oven-dried Material.*

	Moisture.	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	%	%	%	%	%	%
Hay	8·35	6·19	93·81	6·04	26·50	61·27
Solid excreta—						
Laird	75·07	11·26	88·74	4·90	37·49	46·35
Kyby........	75·67	10·98	89·02	4·64	37·32	47·06
Lomond	80·72	10·04	89·96	4·73	39·81	45·42
Katrine	76·75	10·13	89·87	4·64	38·28	46·95

In Table XXVI. below we summarise data setting out the digestibility of hay cut 34 days after full bloom in the course of experiments with four horses fed on it for six days.

TABLE XXVI.—*Showing Quantitative Distribution of Constituents in Wheaten Hay cut 34 Days after Full Bloom, and Consumed by Four Horses in Six Days, and of those in Excreta derived therefrom, together with the Calculated Digestibility of these Constituents.*

	Quantities Consumed or Voided.	Dry Matter.	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Laird—							
Hay consumed .	220·56	202·15	12·51	189·63	12·21	53·57	123·85
Excreta voided .	425·94	106·18	11·96	94·22	5·20	39·81	49·21
Digested	—	95·97	0·55	95·41	7·01	13·76	74·64
Kyby—							
Hay consumed .	221·94	203·41	12·59	190·81	12·29	53·90	124·63
Excreta voided .	439·25	106·88	11·74	95·15	4·96	39·89	50·30
Digested	—	96·53	0·85	95·66	7·33	14·01	74·33
Lomond—							
Hay consumed .	180·97	165·86	10·27	155·59	10·02	43·95	101·62
Excreta voided .	454·87	87·68	8·80	78·87	4·15	34·90	39·82
Digested	—	78·18	1·47	76·72	5·87	9·05	61·80
Katrine—							
Hay consumed .	200·62	183·87	11·38	172·49	11·11	48·73	112·66
Excreta voided .	403·56	93·83	9·50	84·33	4·35	35·92	68·61
Means per horse per day—							
Hay consumed .	34·34	31·47	1·95	29·52	1·90	8·34	19·28
Excreta voided .	71·82	16·44	1·75	14·69	0·78	6·27	7·64
Digested	—	15·03	0·20	14·83	1·12	2·07	11·64
Mean coefficients of digestibility ...	—	% 47·76	% 10·17	% 50·24	% 59·09	% 24·80	% 60·37

Albumenoid ratio.................... 1 : 12·24

From Table XXVI. we see that wheaten hay cut 34 days after full bloom relatively to similar hay cut a week earlier, shows a reduction in the digestibility of the dry matter represented by over 3 per cent. ; of over 7 per cent. in the mineral matter ; of over 6 per cent. in the fibre ; and of 2 per cent. in the carbohydrates and fat combined. On the other hand there was an apparent increase in the digestibility of the proteins, which, combined with the decreases in other lines, has led to the narrowing of the albumenoid ratio.

In Table XXVII. below we have summarised both the total and digestible constituents, per cent. and per ton, for wheaten hay cut 34 days after full bloom and retaining 10 per cent. of moisture.

TABLE XXVII.—*Showing Per Cent. and Per Ton Distribution of Total and Digestible Constituents of Wheaten Hay cut* 34 *Days after Full Bloom, and retaining* 10 *per cent. of Moisture.*

	PER CENT.		PER TON.	
	Total.	Digestible.	Total.	Digestible.
	%	%	lbs.	lbs.
Moisture	10·00	—	224·00	—
Dry matter	90·00	42·98	2016·00	962·75
Mineral matter	5·57	0·57	124·77	12·77
Organic matter	84·43	42·42	1891·23	950·21
Proteins	5·44	3·21	121·86	71·90
Fibre	23·85	5·91	534·24	132·38
Carbohydrates and fat	55·14	33·29	1235·14	745·70

APPARENT PALATABILITY OF THE HAY.

Here again, whilst the two geldings ate this hay readily enough, the two fillies were inclined to play with it.

EXPERIMENT VII.—THE DIGESTIBILITY OF WHEATEN HAY CUT 41 DAYS AFTER FULL BLOOM, WHEN THE GRAIN WAS PRACTICALLY RIPE (NOVEMBER 20TH). HAY SAMPLE NO. G.

This hay, when cut, had of course reached a stage not met with in ordinary practice. We wished, however, for the sake of completeness, to push these tests to the ripening of the corn. When the crop was cut down it was quite white, and the grain almost dry. Later on, at stacking time, the hay showed on examination very white and brittle, whilst the grain could be described as a good seeding sample.

The general analysis of this hay, together with that of the excreta derived therefrom, is shown below in Table XXVIII.

TABLE XXVIII.—*Showing General Analysis of Wheaten Hay cut with the Grain ripe, together with that of the Excreta of Four Horses exclusively fed thereon. Results expressed in terms of Oven-dried Material.*

	Moisture.	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	%	%	%	%	%	%
Hay	8·69	6·03	93·97	5·95	27·83	60·19
Solid excreta—						
Laird	75·83	10·48	89·52	4·61	38·46	46·45
Kyby........	76·12	10·58	89·42	4·66	36·40	48·36
Lomond	82·23	9·47	90·53	4·58	39·87	46·08
Katrine	77·71	10·41	89·59	4·45	37·81	47·33

In Table XXIX. below we supply data showing the digestibility of ripe wheaten hay fed for six days to four horses.

TABLE XXIX.—*Showing Quantitative Distribution of Constituents in Wheaten Hay, cut with the Grain Ripe, and Consumed by Four Horses in Six Days, and of those in the Excreta derived therefrom, together with the Calculated Digestibility of these Constituents.*

	Quantities Consumed or Voided.	Dry Matter	Mineral Matter.	Organic Matter.	Proteins.	Fibre.	Carbohydrates and Fat.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Laird—							
Hay consumed .	218·21	199·25	12·01	187·23	11·86	55·45	119·93
Excreta voided .	417·16	100·83	10·57	90·26	4·65	38·78	46·84
Digested	—	98·42	1·44	96·97	7·21	16·67	73·09
Kyby—							
Hay consumed .	218·70	199·69	12·04	187·65	11·88	55·58	120·20
Excreta voided .	438·78	104·79	11·09	93·70	4·88	38·14	50·67
Digested	—	94·90	0·95	93·95	7·00	17·44	69·53
Lomond—							
Hay consumed .	165·11	150·58	9·08	141·50	8·96	41·91	90·63
Excreta voided .	422·10	75·02	7·10	67·92	3·44	29·91	34·57
Digested	—	75·56	1·98	73·58	5·52	12·00	56·06
Katrine—							
Hay consumed .	187·15	170·89	10·30	160·58	10·17	47·56	102·86
Excreta voided .	394·58	87·97	9·16	78·81	3·91	33·26	41·63
Digested	—	82·92	1·14	81·77	6·26	14·30	61·23
Means per horse per day—							
Hay consumed .	32·86	30·02	1·81	28·21	1·79	8·35	18·07
Excreta voided .	69·69	15·36	1·58	13·78	0·70	5·84	7·24
Digested	—	14·66	0·23	14·43	1·09	2·51	10·83
Mean coefficients of digestibility ...	—	% 48·83	% 12·72	% 51·15	% 60·62	% 30·12	% 59·94

Albumenoid ratio,,,,,,,,,,,,,,,,,,,, 1 ; 12·24

A comparison between Tables XXVI. and XXIX. will show that there is not much difference between the digestibility of wheaten hay cut one week before the ripening of the grain and wheaten hay cut with the grain ripe. The most striking difference in the two tables has reference to the apparent digestibility of the fibre, which is over 5 per cent. higher for the riper of the two hays—a fact which to us appears abnormal, but for which we are unable to account. The albumenoid ratio remains the same in the two hays.

We summarise below, in Table XXX., both the total and digestive constituents, per cent. and per ton, for wheaten hay cut with the grain ripe, and retaining 10 per cent. of moisture.

Table XXX.—*Showing Per Cent. and Per Ton Distribution of Total and Digestible Constituents of Wheaten Hay cut with the Grain Ripe, and retaining* 10 *per cent. of Moisture.*

	Per Cent.		Per Ton.	
	Total.	Digestible.	Total.	Digestible.
	%	%	lbs.	lbs.
Moisture	10·00	—	224·00	—
Dry matter	90·00	43·95	2016·00	984·48
Mineral matter	5·43	0·69	121·63	15·46
Organic matter	84·57	43·26	1894·37	969·02
Proteins	5·35	3·25	119·84	72·80
Fibre	25·05	7·54	561·12	168·90
Carbohydrates and fat	54·17	32·47	1213·41	727·33

Apparent Palatability of Hay.

Whilst the two geldings ate this over-ripe hay readily enough, the two fillies did not appear to relish it.

Summary of Digestibility Data for Wheaten Hay cut in Various Stages of Maturity.

We summarise below in Table XXXI. the principal data bearing on the digestibility of wheaten hay cut in various stages of maturity.

TABLE XXXI.—*Showing the Coefficients of Digestibility of the Constituents in Wheaten Hay cut in Various Stages of Maturity, together with their Percentage Distribution in Hay retaining* 10 *per cent. of Moisture.*

Hay Samples.	Dry Matter.		Mineral Matter.		Proteins.	
	Coefficients of Digestibility.	Digestible Percentage in Hay Retaining 10 per cent. of Moisture.	Coefficients of Digestibility.	Digestible Percentage in Hay Retaining 10 per cent. of Moisture.	Coefficients of Digestibility.	Digestible Percentage in Hay Retaining 10 per cent. of Moisture.
	%	%	%	%	%	%
A .	54·32	48·89	24·22	1·56	60·10	3·98
B .	51·87	46·68	42·29	3·09	61·87	4·28
C .	51·70	46·53	33·36	2·07	60·07	3·55
D .	51·82	46·64	29·38	1·83	53·87	2·76
E .	50·63	45·57	17·59	1·00	56·24	2·75
F .	47·76	42·98	10·17	0·57	59·09	3·21
G .	48·83	43·95	12·72	0·69	60·62	3·25

Hay Samples.	Fibre.		Carbohydrates and Fat.	
	Coefficients of Digestibility.	Digestible Percentage in Hay Retaining 10 per cent. of Moisture.	Coefficients of Digestibility.	Digestible Percentage in Hay Retaining 10 per cent. of Moisture.
	%	%	%	%
A	46·99	12·95	61·56	30·41
B	44·46	13·17	56·63	26·14
C	33·84	8·67	61·69	32·26
D	32·42	7·91	62·91	34·15
E	30·93	7·59	62·33	45·57
F	24·80	5·91	60·37	33·29
G	30·12	7·54	59·94	32·47

Table XXXI. has been given graphic illustration in Fig. 3.

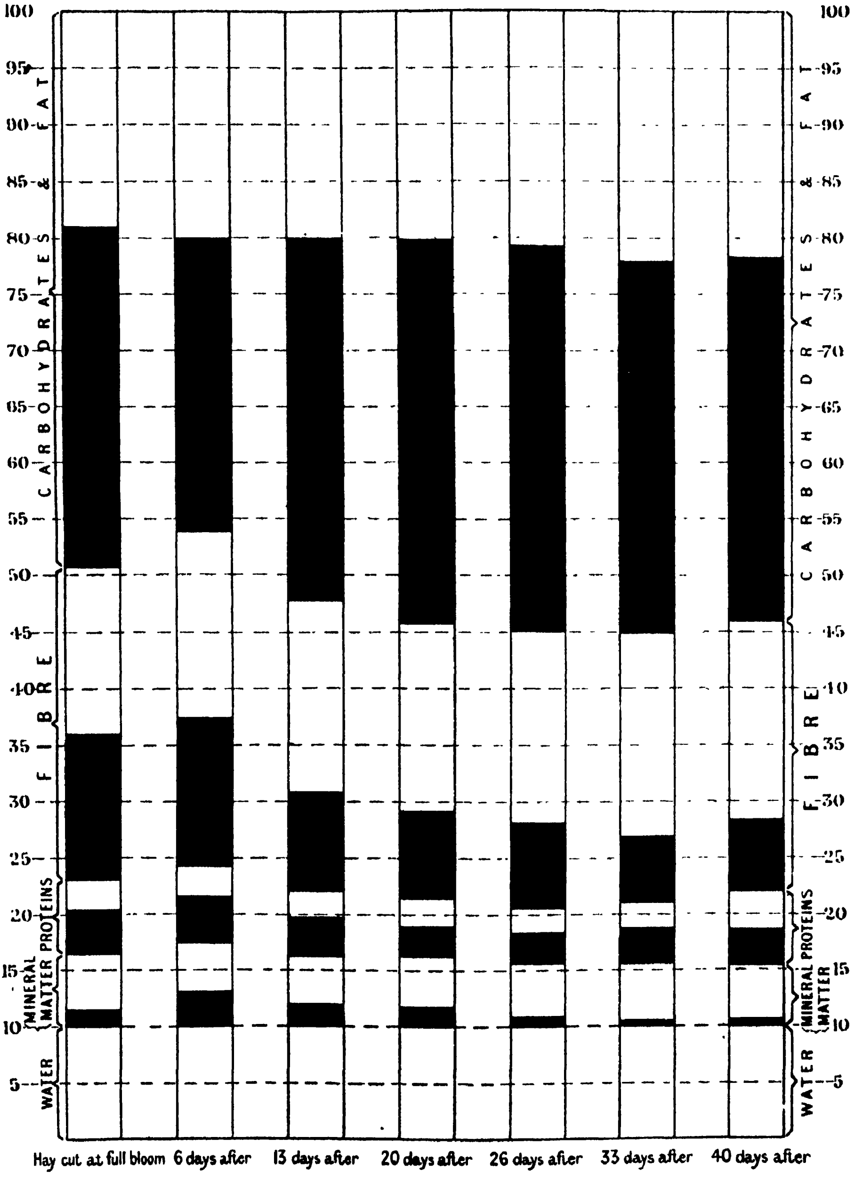
It will be noted in the first place that the digestibility of the total dry matter declines steadily from hay that is cut at full bloom to hay cut when the grain is ripe. So much is this the case that, if we were to value hay on this basis alone, we might say that the feeding value of 1 ton of hay cut at full bloom is equivalent to the feeding value of—

1 ton 0cwt. 106lbs. of hay cut six days after full bloom.
1 ton 1cwt. 2lbs. of hay cut 13 days after full bloom.
1 ton 0cwt. 108lbs. of hay cut 20 days after full bloom.
1 ton 1cwt. 51lbs. of hay cut 27 days after full bloom.
1 ton 2cwts. 84lbs. of hay cut 34 days after full bloom.
1 ton 2cwts. 28lbs. of hay cut with the grain ripe.

Figure 3 - Illustrating Table 31

And showing relative proportions of Digestible and Undigested Material in constituents of Wheaten Hay cut in various stages of development.

Within each bracket the dark portion of the column represents Digestible Material



This decrease in the digestibility of rapidly ripening hay appears to be most marked and regular in the matter of fibre and mineral matter. A decrease in the digestibility of other constituents is also perceptible, as a rule, but is less marked and less regular. It must be recognised, however, that this difference in digestibility is not as great as might, perhaps, have been anticipated.

Of greater importance, perhaps, is the gradual widening of the albumenoid ratio, which is another feature of advancing maturity. For the sake of comparison we summarise these results below.

TABLE XXXII.—*Showing Albumenoid Ratios for Wheats cut in Various Stages of Maturity.*

At full bloom time	1 : 10·9
Six days after full bloom	1 : 9·5
Thirteen days after full bloom	1 : 11·5
Twenty days after full bloom	1 : 15·25
Twenty-seven days after full bloom	1 : 15·2
Thirty-four days after full bloom	1 : 12·24
With grain ripe	1 : 12·24

AVERAGE QUANTITIES OF SOLID EXCRETA VOIDED IN 24 HOURS BY HORSES FED ON WHEATEN HAY CHAFF.

In these experiments we had four horses fed exclusively on wheaten hay chaff for a period of 70 days, and during 42 of these the solid excreta were carefully collected and weighed. We are therefore in a position to state accurately what are, in these conditions of feeding, the average quantities of solid excreta voided by horses in a period of 24 hours. For this period we found the mean figures to be 72·66lbs. of solid excreta, of an average moisture contents of 78·57 per cent., in 24 hours. The average quantity of chaff fed during this period was 35·10lbs., of an average moisture contents of 9·58 per cent.; whilst the average weight of the horses over this period was 1,419lbs.

It might be pointed out here how necessary it is that horses maintained on a dry diet should have easy access to an ample supply of drinking water for the healthy action of the digestive functions. The moisture in the mean quantity of solid excreta voided in 24 hours is represented by 57·09lbs., whilst the moisture present in the food consumed was only 3·36lbs. This leaves 53·75lbs. or over 2½galls., to be supplied from drinking water, over and above the liquid voided in the form of urine, or given off from the body in evaporation.

GENERAL CONCLUSIONS.

It remains for us to summarise what appear to be the general conclusions that may be drawn from these two years' experiments.

1. The yield of a crop of wheat cut down for hay will vary considerably according to the stage of development which the crop has attained to.

2. If we combine the results of the two seasons' experiments we find the average increase in yield above that of a crop cut in the full bloom stage to be—

20·31	per cent.	in the case of	hay cut	6	days	after full bloom.
24·02	"	"	"	13	"	"
36·04	"	"	"	21	"	"
32·62	"	"	"	28	"	"
21·90	"	"	"	35	"	"
14·24	"	"	"	42*	"	"

* Grain ripe.

It follows, therefore, that maximum yields will be secured from cuts taken about three weeks after full bloom, at a time when the grain is just about to leave the milky stage. In this connection it should be recollected that these three weeks have reference to an early wheat grown under conditions of climate such that there elapses a period of six weeks between full bloom and the ripeness of the grain. In a general way it is perhaps better to state that maximum hay yields may be expected from cuts taken when the grain is about to leave the milky stage and enter upon the dough stage.

3. We note that in the three weeks that follow full bloom time total increase in hay yield is distributed between ears on the one hand, and culms and flag on the other, but in uneven proportion, the ears increasing in weight at a far more accelerated ratio than the culms and flag. From the third week after full bloom down to complete grain ripeness the ears continue steadily to gain weight. Culms and flag, on the other hand, lose weight correspondingly in the same period, until, in the last fortnight of the grain development they actually contain less dry matter than was the case at full bloom time.

If we combine the results of the two seasons the following figures will serve to indicate the nature of the increases gained respectively by ears on the one hand, and by culms and flag on the other, over and above their original weight at full bloom.

TABLE XXXIII.—*Showing Mean Percentage Increases* (1911 *and* 1912) *of Ears on the one hand, and Culms and Flag on the other, above Original Weights at Full Bloom Time.*

	Ears.	Culms & Flag.
At full bloom time	100·00	100·00
Six days after	137·77	118·28
Thirteen days after	153·10	119·98
Twenty-one days after	246·75	120·48
Twenty-eight days after	321·05	106·70
Thirty-five days after	337·00	92·54
Forty-two days after (grain ripe)	340·40	83·33

We conclude, therefore, that when the grain begins to leave the milky stage there is not only a great disproportion between the relative weights of ears on the one hand, and culms and flag on the other, but relatively to the period of full bloom, a loss of weight in the latter, which although at first compensated for by a corresponding increase in the weight of the ears, becomes in the end an actual loss of what might have been good feeding material had the crop been cut earlier. In other words, hay cut after the milky stage of the grain tends more and more to become ill-balanced hay, in which the culms and flag rapidly lose their feeding value ; whilst if the hay is not cut at least a fortnight earlier than the ripening of the grain there arises to the grower an actual loss of hay.

4. In the matter of the chemical composition the chief differences between hay cut at full bloom and later cuts are as follows :—(1) Progressive decrease in the percentage of mineral matter and corresponding increase in that of organic matter characterises the gradual ripening off of the crop. (2) The percentage of proteins shows a tendency to rise during the first three weeks ; thereafter it steadily declines to the ripeness of the grain. (3) The percentage of fat appears to remain more or less stationary throughout the whole period. (4) The percentage of carbohydrates rises regularly and steadily in the ears throughout the six weeks. It is balanced by a corresponding regular decrease in culms and flag. (5) Conversely, whilst the percentage of fibre steadily rises in culms and flag, it equally steadily declines in the ears.

5. We note a heavy loss of dry matter in the last two or three weeks of the development of the wheat crop, a loss which attained to 22·9 per cent. of the maximum cut in 1911, and 6·41 per cent. of the maximum cut in 1912. This loss, no doubt, must be attributed chiefly to the fall of the exhausted flag, and to a less degree to occasional shaking out of grain and other accidental causes ; to the weakening or suspension of the assimilation function ; and to the occasional leaching action of rain on a dry, porous tissue. In each year, however, we found that the proportional loss of mineral matter was considerably greater than that of organic matter, and we infer therefrom that as maturity advances there must be some sort of migration of the mineral matter towards the root system.

6. The loss of weight on drying of a wheaten hay crop becomes gradually less and less as the ripening of the grain is approached. It is represented by close on three-quarters of the green weight of the crop in the full bloom stage, and by less than one-quarter of the green weight when the grain is ripe.

7. The percentage of moisture retained by wheaten hay varies slightly with the conditions under which the hay was dried. Generally speaking, however, early-cut hay retains slightly more moisture than late-cut hay. We submit, however, that in round figures 10 per cent. represents the average moisture contents of South Australian wheaten hay.

8. When a crop of hay is left to dry in a field, the loss of weight observed is not exclusively the result of the evaporation of water. Intimate chemical reactions set up in the drying cells of the plants, the ultimate result of which is the destruction of more or less organic matter. We submit tentatively that for wheaten hay losses in this direction may attain to slightly over 1½ per cent. of the original green weight, and that it is connected chiefly in the breaking down of carbohydrates.

9. Direct digestion experiments show that hay cut at full bloom is more highly digestible than any hay cut at later periods, and that in general the digestibility of wheaten hay decreases by regular steps as the period of complete ripeness is approached. In this connection there is a difference of over 12 per cent. between the digestibility of hay cut at full bloom and that of hay cut a week before the ripening of the grain.

10. This superior digestibility of wheaten hay cut at full bloom holds good all along the line, with the exception, perhaps, of the doubtful case of the mineral matter. The regular decline in the digestibility of hays cut at later periods is most marked in the case of proteins and fibre. Carbohydrates are, on the whole, rather erratic in their behaviour, and perhaps on the whole they may be considered more or less stationary in their direct digestibility.

11. The albumenoid ratio is narrower and more favorable in character in the earlier cut hays than in those in more advanced stages of development. This arises from the more highly digestible condition of the proteins in the less mature cuts of hay, and the overwhelming preponderance of carbohydrates in the later cuts.

12. We note that the average weight of solid excreta voided in 24 hours by draught horses of an average weight of 1,420lbs., and consuming 35lbs. of wheaten chaff, is represented by 72·66lbs.

13. It appears to us that there is nothing to be gained, and much to be lost, in deferring the cutting of wheaten hay until the grain begins to enter upon the dough stage. It involves, as a rule, both a reduction in total yields of hay and a reduction in quality represented by a reduced digestibility and a wider albumenoid ratio. Assuming that hay-cutting operations can be completed within a week to 10 days, we are of the opinion that these operations should be put in hand not later than a fortnight after full bloom.

14. These experiments of ours amply confirm the value of the usual commercial standard by which hay is judged, viz., color. It may be taken for granted that any hay that is not of a good bright green color is of inferior quality for feeding purposes, although it might make excellent litter.

POULTRY NOTES.

By D. F. Laurie, Government Poultry Expert and Lecturer.

To Promote Feathering.

Many people, especially those who breed some of the heavier sorts of fowls, complain that the chickens do not feather well, but remain bare. During the next few months moulting will be general, and unless the food supplies the necessary material the system cannot elaborate the feather-forming compounds. Feathers are largely built up of a protein material called keratin, which contains a large percentage of sulphur. The white of an egg also contains sulphur. To give crude sulphur to poultry is not always advisable, and even when it is care is necessary to give only a proper quantity. An old-fashioned method of administering sulphur is still the best, viz., as sulphuret of lime (calcii sulphurati). It is made as follows :—Procure a large iron saucepan—an old one will do. Place in the saucepan four lumps of quicklime each as large as a duck's egg. Slake the lime with boiling water, and then stir in 6ozs. of flowers of sulphur and add 2qrts. of boiling water, stirring gently. Boil this mixture for an hour and then let it cool and settle. Pour off and bottle the clear liquid. Keep this out of the dwelling-house, as the fumes given off are most disagreeable. Of this liquid for every eight hens or 12 chickens add to the water used for mixing the daily mash one teaspoonful.

Another very good mixture is as follows :—Take half a pound of linseed (flax seed), place in a large saucepan and boil to a jelly ; stir in half an ounce of each flowers of sulphur and common salt. Do not keep this in a dwelling-house. For each fowl add one teaspoonful to the daily mash.

Proper Sulphur Ointment.—This is very useful for applying to places denuded of feathers. It is also excellent for parrots, cage birds, &c. It may be made in ounces or pounds according to the following formula :—Flowers of sulphur, 1 ; glycerine, 1 ; lard, 10 ; white wax, 4. Melt the glycerine, lard, and white wax in an iron pan, and while cooling stir in the sulphur.

Cooling Medicines.

Green foods are rich in minerals and salts, and should be freely used. Sometimes it is necessary to supplement, or make good the want of, sufficient green food. Epsom salts are generally recommended, and they are excellent for fowls, but not so good for ducks and turkeys. Epsom salts are magnesium sulphate. Glauber salts, which are sodium sulphate, are dearer, but are more suitable, and are, in fact, invaluable for laying hens. For their proper administration a stock solution should be kept in a bottle. Dissolve in a pint of hot water 4ozs. of Glauber salts, and of this add one tablespoonful to each pint of drinking water; or it may be added in the same proportion to the water used for the mash. The action on the liver and bile ducts is excellent. As a tonic for the oviduct and as a precaution against protusion and other troubles this salt is excellent. For fowls the two salts—Epsom and Glauber—may be used in combination, viz., 2ozs. of Epsom to 1oz. of Glauber, and made into the stock solution.

To Destroy Red Mites, Etc., in Poultry Houses.

Obtain powdered napthaline and dissolve half a pound in a gallon of kerosine. apply freely to perches, cracks, crevices, and all haunts of this pest. This odorous mixture is deadly to such pests as red mites, ticks, &c.

Autumn Breeding.

Get your most forward old hens ready for breeding next month. Those that have not started to moult and are still laying will do; others may have finished moulting at the end of February, and will lay in March. Mate these with vigorous cockerels, and you will have strongly fertile eggs. Those breeders who have adopted autumn breeding find it extremely profitable.

Heavy Breeds at the March Show.

Visitors to the R.A. & H. Society's March Show in Adelaide are especially invited to visit the section allotted to the General Purpose Poultry Society, which was recently formed to carry out a series of competitions to demonstrate all the points of various breeds of poultry. There will be 28 competitors who will exhibit six pullets, three cockerels, and a dozen eggs representing Gold, Silver, and White Wyandottes; Barred and White Rocks; Black, Buff, and White Orpingtons; Rhode Island Reds, Langshans, Indian and Old English Game. The six pullets of each entry will, after the show, be sent to Parafield, where they will form Section 4 of the laying competitions. On the second day of the show the three cockerels of each breed which were exhibited alive the first day will be killed and dressed and exhibited as table birds, and should make a fine display.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, to terminate March 31st, 1914.]

SECTION 1.—LIGHT BREEDS.

White Leghorns.

Competitor.	Eggs Laid for Month ended Jan. 31st.	Total Eggs Laid from April 1st, 1913, to January 31st, 1914.
Hurford, E. W., Grangeville	83	1,054
Hammill, H., Kogarah, New South Wales	87	1,112
Carter, A. A., Keswick	84	863
Robins, G. W., Hawthorn, Victoria	95	1,099
Dunn, L. F., Keswick	106	1,071
McKenzie, H., Northcote, Victoria	98	1,151
Cowan Bros., Burwood, New South Wales	90	1,045
Robbins, G. W., Hawthorn, Victoria	97	981
Pettigrove, T. A., Northcote, Victoria	85	1,064
Eckermann, W. P., Eudunda	67	846
Robertson, F., New Hindmarsh	104	939
Pettigrove, T. A., Northcote, Victoria	69	961
Cant, E. V., Medindie	62	898
Schäfer, N. H., Strathalbyn	113	1,064
Redfern Poultry Farm, Caulfield, Victoria	102	1,046
Chapman, G. H., Port Pirie	63	714
Lewis, F. M., Caulfield, Victoria	134	1,055
Redfern Poultry Farm, Caulfield, Victoria	117	1,153
Hagel, W. C., Mallala	121	1,080
Hocking, E. D., Kadina	114	915
Sargenfri Poultry Yards, East Payneham	93	999
Joass, W. A., Rothbury, New South Wales	87	1,060
Bennett & Furze, Wright Street, Adelaide	89	981
Jury, W. H., Torrensville	107	1,038
Olive Poultry Farm, Freeling	123	1,081
Kelly, Mrs. W. J. L., Quorn	82	648
Indra Poultry Farm, Freeling	99	1,221
Electricum Poultry Yards, Glenelg	85	929
Sargenfri Poultry Yards, East Payneham	124	1,154
Moritz Bros., Kalangadoo	138	1,193
Brown, S., Gembrook South, Victoria	85	1,000
Matthews, H. G., Fullerton	89	1,061
Harris, J. G., Black Forest	62	1,048
Tockington Park Poultry Farm, Grange	99	1,044
Bradley, J. E., Newport, Victoria	106	1,181
Miller, B., Parkside	100	901
McKenzie, E., Northcote, Victoria	117	1,281
Tockington Park Poultry Farm, Grange	114	1,152
Provis, W., & Son, Tumby Bay	119	1,136
Hillcrest Poultry Farm, Brighton, Victoria	67	1,063

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended Jan. 31st.	Total Eggs Laid from April 1st, 1913, to January 31st, 1911.
SECTION I.—LIGHT BREEDS—*Continued.*		
WHITE LEGHORNS—*Continued.*		
Beadnall Bros., Gawler	82	893
Morgan & Watson, Frankston, Victoria	82	1,171
Gibbs & Pine, Queenstown	90	809
Hillside Poultry Yards, Hamley Bridge	66	840
Hall, A. W., South Oakleigh, Victoria	92	1,042
Dreyer, G. H., Wolfram Street, Broken Hill	93	1,080
South Yan Yean Poultry Farm, Doreen, Victoria	124	1,116
Pope, R. W., Heidelberg, Victoria	109	1,212
Tabuteau, J. O., Black Rock, Melbourne	88	973
"Koonoowarra," Enfield	119	959
Hagger, J. C., Orroroo	134	1,154
Bertelsmeier, C. B., Clare	135	1,050
South Yan Yean Poultry Farm, Doreen, Victoria	115	1,092
Jelliff, Mrs. T., Beverley, Adelaide	133	1,158
Hughes, J. J., Elsternwick, Victoria	111	1,027
Stewart, J. R., Thirlmere, New South Wales	84	913
Aveling, T. B., Quorn	122	845
"Nunkerowi," Neales Flat	94	853
Prior, D., Moonta Mines	88	884
Leonard, W. J., Port Pirie	109	989
Barkla, L. W., Gawler South	117	955
Foreman, E., Hindmarsh	132	1,034
Broderick Bros., Gawler	78	828
Tubb, E. C., Frewville	133	911
Harfield, B. L., Pinnaroo	90	875
Foreman, E., Hindmarsh	98	945
Tomlinson, W., Westbourne Park	124	1,038
Woodhead, H., Torrensville	107	1,084
Padman, A. H., Hyde Park	117	1,066
Franklin, G., Norwood	104	1,042
Mathias & Weller, Unley	97	866
Messenger, A., Port Adelaide	115	1,119
Albion Poultry Farm, Magill	102	1,011
Dunstan, L. A., Port Pirie	125	960
Trenwith, T. H., Kadina	83	811
Purvis, W., Glanville	127	1,138
Rice, J. E., Cottonville	92	992
Evans, H. A., Richmond	131	993
Miels, C. & H., Littlehampton	120	1,066
Swift, W. G., Northcote, Victoria	135	1,157
Bertelsmeier, C. B., Clare	116	1,041
Brundrett, S., Moonee Ponds	126	1,015
Glenelg River Poultry Farm, Mount Gambier	100	971
Padman, A. H., Hyde Park	97	982
Purvis, Miss Gracie, Glanville	126	1,000
Braund, J. E. & H. J., Islington	115	1,024
Ontario Poultry Farm, Clarendon	60	763
Brock, A. G., Hamley Bridge	101	892
Russell, E. L., Salisbury	98	981
Schwabl, J., Elsternwick, Victoria	117	1,063
Moritz Bros, Kalangadoo	116	1,035
Craig Bros., Hackney	110	997
Codling, H., Mitcham Park	47	678

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended Jan. 31st.	Total Eggs Laid from April 1st, 1913, to January 31st, 1914.
SECTION I.—LIGHT BREEDS—*Continued.*		
WHITE LEGHORNS—*Continued.*		
Tidswell, H. J., Clarence Park	92	765
Bennett, E. V., Kalangadoo	101	971
Lillywhite, R. G., Malvern	110	928
Harris, A. W., Mallala	91	1,018
Hagger, W. H., Malvern	95	1,022
Winter, W. C., (Nalpa), Strathalbyn	52	611
Whitegate Poultry Farm, Deepdene, Victoria	107	977
BROWN LEGHORN.		
Toe, C. E., Brighton, Victoria	72	630
BLACK MINORCA.		
Whitrow, A. J., Knoxville	39	753
SECTION II.—HEAVY BREEDS.		
BLACK ORPINGTONS.		
Neville, A. B., Fullarton	74	857
Thornton, W. J., Kew, Victoria	72	838
Kenway, D., West Pennant Hills, New South Wales	84	1,098
Martin, B. P., Unley Park	66	946
Cowan Bros., Burwood, New South Wales	93	960
Tockington Park Poultry Farm, Grange	87	852
Pearson, W. S., Kingswood	77	821
Hall, A. W., South Oakleigh, Victoria	74	799
Padman, J. E., Plympton	81	886
Greaves, W. E., Prospect	74	649
Bertelsmeier, C. B., Clare	50	496
Coto, T. W., Myrtle Bank, Victoria	96	983
Convent of the Good Shepherd, Oakleigh, Victoria	67	803
BUFF ORPINGTONS.		
Hocart, F. W., Clarence Park	42	714
SILVER WYANDOTTES.		
Dunn, L. F., Keswick	51	869
Western, F. C., Marion	77	736
Kappler Bros., Marion	50	661
WHITE WYANDOTTES.		
Bradley, J. E., Newport, Victoria	90	926
BLACK LANGSHANS.		
Stevens, E. F., Littlehampton	72	821
FAVEROLLES.		
Williams, W. H., Frewville	72	638
DORKINGS.		
Cathcart, J. F., Newburg, Scotland	47	640

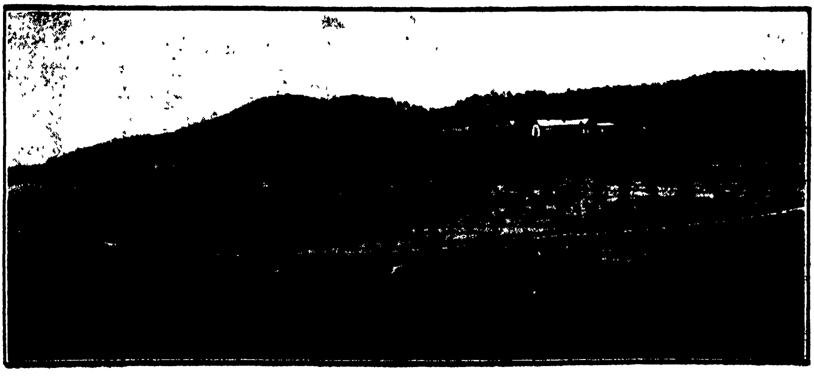
EGG-LAYING COMPETITION—*Continued.*

SECTION III.—PRODUCERS.

Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.

Competitor.	Eggs Laid for Month ended Jan. 31st.	Total Eggs Laid from April 1st, 1913, to January 31st, 1914.
WHITE LEGHORNS.		
Broster, G., Mallala	85	923
Carling, R., Kangaroo Flat	138	1,139
Rowe, J., Long Plain	113	1,056
Broster, G., Mallala	97	989
Gilbert, F. W., Kangaroo Flat	88	1,058
Campbell, J. D., Barabba	91	1,073
Forest Leigh Poultry Farm, Jamestown	88	839
Kerr, R., Longwood	96	1,063
Carling, Mrs., R., Kangaroo Flat	88	1,071
Rowe, J., Long Plains	82	1,010
Gill, R., Marrabel	82	850
Wurst, G. H., Marrabel	106	969
Sherrah, E., Long Plain	99	931
Rowe, N., Long Plain	80	980
Shepherd, R. H., Balaklava	89	960
Lacey, F. C., Kybybolite	76	853
Bertelsmeier, O. O., Booborowie	107	998
Dunn, H. J., Black Springs	91	842
Rackham, C. Naracoorte	81	1,050
Holmes, F. A., Naracoorte	59	755
Hutchison, W. J. S., Naracoorte	67	694
"Herdsfield," Mount Gambier	102	1,121
Smith, R. L., Hynam	53	764
Gill, Mrs. J., Kapunda	86	800
Sampson, C., Kooringa, Burra	102	1,161
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	60	636
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	62	806

D. F. LAURIE, Poultry Expert.



Orchard, Near Clare.

PARAFIELD EGG-LAYING COMPETITION.

MONTHLY REPORT.

Health of Birds.

The general health of the birds has been good. There were 10 deaths—four in Section 1, one in Section 2, and five in Section 3; causes various. One bird developed an ovarian cyst, and had to be replaced. There are now five pens which are one bird short, viz., pens 16, 36, 41, 143, and 149. Pen 148 is two birds short. There have been no replacements by owners, and thus their scores are small.

Moulting.

The birds are now showing signs of a general moult.

Egg Production.

The seasonable falling off due to the moult and other causes is affecting the egg yield. In last month's report reference was made to a new nine month's record. This should have been in reference to previous records at Roseworthy. Last year Messrs. Moritz Bros'. score was 1,170 at Kybybolite as against McKenzie's 1,164 this year.

The weather has been seasonable; generally mild, with warm days; 57 points of rain fell. The score for the leading pen, Section 1, E. McKenzie, Victoria, was 1,287; Section 2, D. Kenway, New South Wales, 1,098; Section 3, C. Sampson, South Australia, 1,161.

The averages are still maintained, and show a satisfactory advance on last year's figures. It is useless attempting any forecast, but appearances point to satisfactory final results.

D. F. LAURIE, Poultry Expert and Lecturer.

Camel Team, Oodnadatta.

THE WHEAT MARKET.

Advices received from Europe indicated that for practically the whole of January the wheat market was quiet and little trading done. Locally the market was steady, with growers not much inclined to operate.

Under date London, January 2nd, *Beerbohm's Evening Corn Trade List* states :- -The latest information received points to a shortage in the exports from Argentina and India this year of about 8,000,000qrs. compared with 1913, but the surplus remaining in Russia and Roumania, although nothing definite is known, is generally believed to be considerably larger than at this time last year. Australia has a surplus of about 2,000,000qrs. more than in 1913, whilst Canada and the United States have still large quantities left, over and above the home requirements, the last two crops having been very large ones ; but whether America will be a free seller at present prices remains to be seen. In this connection much will depend, especially a little later in the year, on the prospects of the next winter wheat crop. The present outlook is an exceptionally favorable one, on a record area, but, of course, much may happen between now and harvest time. In Europe the present condition of the autumn sown crops is a satisfactory one. There has been more disposition shown, during the past few weeks, to offer native wheat freely in most European countries, and, if the official estimates of the yields were correct, farmers must hold a larger proportion of their crops than usual.

The preliminary official estimate of the Argentine wheat crop has been cabled over this week, and shows the crop to be a very disappointing one, the yield of 16,500,000qrs. being quite as small, if not smaller, than the lowest private estimates pointed to. The home consumption is about 8,000,000qrs., and on this basis there would only be about 8,500,000qrs. for export, against 13,400,000qrs. exported in the 12 months ended yesterday. This year's shipments from the Argentine from January to April will probably be less than half last year's exceptionally big total, partly owing to the crop being a very small one, and partly because there is much more wheat available from Russia, Roumania, and Australia than was the case last year.

The preliminary official estimates of the area sown to wheat in India have now been received for all districts except Hyderabad and Rajputana, and show a decrease in the acreage of about 13 per cent. compared with the preliminary estimate last year, but of no less than 20 per cent. compared with last year's final figures. It is quite probable that these two districts will also show a decrease, but it is also probable that the final figures for the Punjab, Bombay, and Central India will be appreciably larger than the preliminary figures. It is impossible to estimate the probable yield, but, according to private reports received by firms engaged in the Indian trade, the exports next season are not expected to exceed 3,000,000qrs., or less than half the present season's total.

Date.	LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
Jan. 6	Quiet	3/5½ to 3/6½	3/5¾	3/5¾
7	Steady, but quiet	Do.	Do.	Do.
8	Quiet	Do.	3/5½	3/5½
9	Quiet ; Liverpool dull	Do.	Do.	Do.
10	Dull and neglected ; Liverpool no demand	Do.	3/5¼	3/5¼
12	—	3/5½ to 3/6	Do.	Do.
13	Steady, but quiet ; Liverpool quiet	3/5½ to 3/6½	Do.	Do.
14	Firm ; Liverpool firmly held, but inactive	3/6 to 3/6½	3/5¾	3/5½
15	Firmly held, inactive ; Liverpool steady	Do.	3/5½ to 3/5¾	3/5½ to 3/5¾
16	Firm, Dec.-Jan., 4/5⅝d. ; April-May, 4/5¼d. ; Liverpool firmer, improved demand	3/6 to 3/6¾	3/5¾ to 3/6	3/5¾ to 3/6
17	Firm, quiet ; Liverpool steady, Australian to arrive, 4/5⅝d.	Do.	Do.	Do.
19	—	3/6 to 3/7	3/5¾	3/5¾
20	Quiet	3/6½ to 3/7	Do.	Do.
21	Firm, but quiet	3/6 to 3/6½	3/5½ to 3/5¾	3/5½ to 3/5¾
22	Firmly held, inactive	Do.	Do.	Do.
23	Firm, more inquiry ; Liverpool firmly held, inactive ; Australian afloat, 4/5⅝d.	Do.	Do.	Do.
24	Firmly held, inactive	3/6½ to 3/7	3/6	3/6
26	—	Do.	Do.	Do.
27	Firm, but quiet	Do.	Do.	Do.
28	Dull, with easier tendency	Do.	3/5¾ to 3/6	3/5¾ to 3/6
29	Dull	Do.	3/6¼	3/6¼
30	Steady, quiet ; Liverpool steadier tone, not active ; Feb.-March, 4/5¼d.	Do.	Do.	3/6¼ to 3/6½
31	Quiet ; Liverpool steady, no quotation	Do.	Do.	Do.
Feb. 2	—	Do.	3/6	3/6 to 3/6½
3	Dull, easier tendency ; Dec.-Jan., 4/4⅝d. ; Liverpool depressed	Do.	Do.	Do.
4	Steady, but quiet	Do.	3/6 to 3/6¼	Do.
5	Quiet	Do.	Do.	Do.

Steamer Freights.—(February 2nd)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, medium size, March, 25s. per ton (8d. per bushel) ; to South Africa, 22s. 6d. to 23s. 9d. per ton (7⅕d. to 7⅗d. per bushel), prompt or new season. Parcels, Port Adelaide to London-Liverpool, or Continent, 27s. 6d. per ton (8$\frac{9}{10}$d. per bushel) ; Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel) ; to Sydney, 10s. 6d. per ton (3¼d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 26s. 3d. per ton (8⅖d. per bushel), new crop ; South Africa, 23s. 9d. per ton (7⅗d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

The General Manager of the Produce Department reports on February 2nd—

BUTTER FACTORY.

The supply of cream to hand during the month compared very favorably with that received in the corresponding period of last year, and the demand for butter has been very consistent. There has been a slight drop in prices during the month, the present quotations being superfine 1s 2¼d per lb., and pure creamery 1s. 0½d. per lb.

A. W. Sandford & Co., Limited, reported on February 1st—

BUTTER.—The month of January was on the whole cool, with one or two short spells of heat. Values in butters maintained the advance recorded last month, and have throughout January been practically stationary in top grades, though poorer qualities and heat affected lots have met a more dragging sale. Best factory and creamery, fresh in prints, realised 1s. to 1s. 2½d. per pound; choice separators and dairies, 10d. to 1s.; store and collectors', 7½d. to 8d.

EGGS.—Supplies have held up very well with very slight fluctuation, though during the closing days of the month an advance set in owing to a marked cut-off in quantities coming forward. Hen are selling at 8½d. per dozen, and duck at 9d.

CHEESE.—Good business was again reported in this line both for local and export trade, without any quotable alteration in rates, which are—Large to loaf, 5d. to 5½d. per pound.

BACON.—Usually business in bacon is slow during January, but this year has been an exception, and although high prices have ruled the steady demand has readily cleared all offering. Best factory-cured sides sold at 10½d. to 11¼d. per lb.; hams, 1s. to 1s. 2d.; nicely cut and cured farm lots, 7d. to 9d.

HONEY.—The new take is coming in more freely and meeting with speedy quittance at 2¾d. per lb. for prime clear extracted. Beeswax, 1s. 2½d.

ALMONDS.—The crop is again late, and very little trade is being recorded in this line. Brandis, 6d.; mixed soft-shells, 5½d.; hard-shells, 3d.; kernels, 1s. 6d.

LIVE POULTRY.—During the month heavy quantities have been marketed, but unfortunately a larger proportion have been poor and light sorts, so that buyers were more critical in their purchasings. Anything of quality commanded good rates, while medium sorts sold accordingly. Good table roosters brought 3s. to 3s. 6d. each; nice conditioned cockerels, 2s. to 2s. 6d.; hens, 1s. 6d. to 2s.; ducks, 1s. 4d. to 2s. 9d.; geese, 3s. to 3s. 6d.; pigeons, 5½d.; turkeys from 8d. to 10d. per lb. live weight for fair to good table birds.

POTATOES AND ONIONS.—The Adelaide market has been fully supplied with potatoes contributed chiefly by growers in the adjacent hills, and prices have fluctuated very slightly. A little business has taken place in early Gambiers, although samples from there were hardly so ripe as could have been desired. This defect, however, may reasonably be expected to disappear as the present month progresses, and no doubt Mount Gambier will now command increased attention from potato buyers. **ONIONS.**—All orders for onions have been met without any alteration in values, and as good crops are now being pulled in the South-East, prices have a downward tendency. Present quotations—Potatoes, £4 2s. 6d. per ton of 2,240lbs. on rail Adelaide or Port Adelaide; 4s. to 5s. per cwt. in the market. Onions.—£8 per ton of 2,240lbs. on rail Adelaide or Port Adelaide, 7s. to 8s. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of January, 1914, also the average precipitation to the end of January, and the average annual rainfall.

Station.	For Jan., 1914.	Av'ge. to end Jan.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.			
Oodnadatta	2·59	0·57	4·76
Tarcoola	—	0·25	7·58
Hergott	0·61	0·48	6·04
Farina	0·37	0·55	6·70
Leigh's Creek	0·35	0·70	8·66
Beltana	0·44	0·73	9·22
Blinman	0·58	1·10	12·85
Hookina	—	—	—
Hawker	0·28	0·53	12·22
Wilson	0·15	0·62	11·78
Gordon	0·21	0·39	10·26
Quorn	0·51	0·60	13·78
Port Augusta	0·26	0·54	9·46
Port Augusta W.	0·29	0·48	9·36
Bruce	0·73	0·32	10·01
Hammond	0·42	0·64	11·46
Wilmington	0·32	0·84	18·26
Willowie	0·41	0·33	11·90
Melrose	1·37	1·28	23·04
Booleroo Centre	0·44	0·80	15·83
Port Germein	0·25	0·67	12·84
Wirrabara	1·22	0·64	18·91
Appila	0·47	0·64	15·08
Cradock	0·38	0·58	10·86
Carrieton	0·38	0·78	12·22
Johnburg	0·99	0·54	10·21
Eurelia	0·22	0·74	13·24
Orroroo	0·84	1·03	13·42
Black Rock	0·77	0·67	12·25
Petersburg	0·68	0·81	13·07
Yongala	0·54	0·62	13·94
NORTH-EAST.			
Ucolta	0·6	—	—
Nackara	0·10	—	—
Yunta	0·6	0·69	8·22
Waukaringa	0·54	0·51	7·94
Mannahill	0·10	0·70	8·46
Cockburn	1·25	0·71	7·97
Broken Hill, NSW	0·37	0·76	9·63
LOWER NORTH.			
Port Pirie	0·20	0·61	13·21
Port Broughton	0·5	0·69	14·33
Bute	0·6	0·71	15·42
Laura	0·44	0·72	18·22
Caltowie	0·47	0·67	17·27
Jamestown	0·46	0·66	17·46
Gladstone	0·24	0·66	16·00
Crystal Brook	0·13	0·65	15·62
Georgetown	0·32	0·66	18·32
Narridy	0·6	0·60	16·79
Redhill	0·18	0·56	16·79
Spalding	0·27	0·52	20·25
LOWER NORTH—*continued.*			
Gulnare	0·17	0·60	19·74
Bundaleer W. Wks.	0·11	0·47	17·29
Yacka	0·13	0·52	15·27
Koolunga	0·19	0·61	15·94
Snowtown	—	0·66	15·70
Brinkworth	0·5	0·39	15·48
Blyth	0·2	0·71	16·34
Clare	0·24	0·89	24·30
Mintaro Central	0·6	0·57	21·99
Watervale	0·29	0·92	27·17
Auburn	0·26	1·05	24·25
Hoyleton	0·6	0·82	17·96
Balaklava	0·4	0·76	16·03
Port Wakefield	0·15	0·59	13·13
Terowie	0·49	0·70	13·71
Yarcowie	0·68	0·69	13·91
Hallett	0·80	0·76	16·40
Mount Bryan	0·75	0·47	15·73
Burra	0·19	0·81	17·82
Farrell's Flat	0·10	0·83	18·87
WEST OF MURRAY RANGE.			
Manoora	0·37	0·58	18·09
Saddleworth	0·40	0·81	19·69
Marrabel	0·53	0·75	18·94
Riverton	0·32	0·75	20·48
Tarlee	1·07	0·82	17·48
Stockport	0·98	0·81	15·89
Hamley Bridge	0·91	0·85	16·45
Kapunda	1·55	0·87	19·67
Freeling	0·36	0·82	17·85
Greenock	0·58	0·79	21·46
Truro	1·19	0·74	19·74
Stockwell	0·77	0·76	20·30
Nuriootpa	0·80	0·80	21·25
Angaston	0·82	0·78	22·25
Tanunda	0·98	0·85	22·28
Lyndoch	0·53	0·78	23·01
ADELAIDE PLAINS.			
Mallala	0·57	0·83	16·88
Roseworthy	0·29	0·80	17·31
Gawler	0·41	0·74	19·21
Two Wells	0·57	0·77	16·36
Virginia	0·84	0·77	17·58
Smithfield	0·73	0·51	17·30
Salisbury	0·53	0·77	18·57
North Adelaide	0·97	0·78	21·49
Adelaide	1·07	0·73	21·04
Brighton	0·58	0·62	19·93
Glenelg	0·70	0·66	18·35
Magill	1·24	0·84	25·69
Glen Osmond	0·94	1·09	25·20
Mitcham	0·82	0·85	23·47
Belair	—	1·05	28·64

RAINFALL—*continued.*

Station.	For Jan., 1914.	Av'ge. to end Jan.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.			
Houghton	—	—	—
Teatree Gully	1·29	0·78	28·19
Stirling West	1·17	1·54	46·70
Uraidla	1·75	1·30	44·35
Clarendon	0·57	1·17	33·67
Morphett Vale	0·67	0·87	23·32
Noarlunga	0·38	0·65	20·28
Willunga	0·54	0·78	25·98
Aldinga	0·43	0·58	20·34
Normanville	0·12	0·59	20·65
Yankalilla	0·20	0·54	22·78
Cape Jervis	0·20	0·44	16·34
Mount Pleasant	1·47	0·81	26·87
Blumberg	2·22	1·14	29·38
Gumeracha	1·47	1·09	33·30
Lobethal	1·23	1·05	35·38
Woodside	0·89	1·02	31·87
Hahndorf	0·90	1·10	35·45
Nairne	0·87	1·03	28·83
Mount Barker	1·11	1·04	30·93
Echunga	0·64	1·11	32·83
Macclesfield	0·45	0·95	30·72
Meadows	0·33	1·10	35·52
Strathalbyn	0·38	0·73	19·28
MURRAY FLATS AND VALLEY.			
Wellington	0·58	0·83	15·01
Milang	0·8	0·71	16·08
Langhorne's Bdge	0·21	0·49	15·27
Tailem Bend	0·72	—	—
Murray Bridge	0·40	0·67	14·32
Callington	0·55	0·78	15·65
Mannum	0·78	0·55	11·67
Palmer	0·52	0·51	15·60
Sedan	0·82	0·56	11·92
Blanchetown	0·27	0·58	10·71
Eudunda	0·31	0·80	17·33
Sutherlands	0·88	0·29	10·60
Morgan	0·36	0·51	9·29
Overland Corner	0·25	0·55	11·42
Renmark	0·6	0·50	10·93
Loxton	0·8	—	—
WEST OF SPENCER'S GULF.			
Eucla	—	0·66	10·13
White Well	0·3	0·51	9·67
Fowler's Bay	0·4	0·43	12·11
Penong	0·8	0·39	11·93
Murat Bay	0·12	—	—
Smoky Bay	0·5	—	—
Streaky Bay	—	0·47	15·31
Port Elliston	—	0·40	16·49
WEST OF SPENCER'S GULF—*continued.*			
Port Lincoln	0·18	0·63	19·88
Tumby	0·20	0·28	15·00
Carrow	0·33	—	—
Cowell	0·41	0·43	11·76
Point Lowly	0·13	0·45	12·21
YORKE'S PENINSULA.			
Wallaroo	0·13	0·59	14·05
Kadina	0·17	0·54	15·88
Moonta	0·56	0·56	15·22
Green's Plains	0·16	0·55	15·73
Maitland	0·37	0·62	20·08
Ardrossan	0·41	0·54	13·89
Port Victoria	0·56	0·48	15·20
Curramulka	0·48	0·62	18·51
Minlaton	0·76	0·50	17·41
Stansbury	0·50	0·65	17·06
Warooka	0·63	0·45	17·71
Yorketown	0·30	0·50	17·47
Edithburgh	0·36	0·53	16·48
SOUTH AND SOUTH-EAST.			
Cape Borda	0·26	0·66	25·09
Kingscote	—	0·44	18·95
Penneshaw	0·16	0·63	21·34
Cape Willoughby	0·2	0·74	19·69
Victor Harbor	0·26	0·80	22·18
Port Elliot	0·24	0·71	20·33
Goolwa	0·24	0·69	17·93
Pinnaroo	0·25	0·27	16·74
Parilla	0·29	—	—
Lameroo	0·55	0·52	16·55
Parrakie	0·29	—	—
Geranium	0·38	—	—
Peake	0·34	—	—
Cooke's Plains	0·53	0·59	14·74
Meningie	0·17	0·69	18·87
Coonalpyn	1·40	0·73	17·49
Tintinara	0·44	0·52	18·78
Keith	0·62	—	—
Bordertown	0·27	0·81	19·76
Wolseley	0·24	0·61	17·72
Frances	0·11	0·75	20·74
Naracoorte	0·97	0·83	22·60
Penola	0·35	1·09	26·78
Lucindale	0·38	0·76	23·32
Kingston	0·32	0·75	24·73
Robe	0·11	0·80	24·69
Beachport	0·17	0·95	27·51
Millicent	0·62	1·01	29·25
Mount Gambier	0·73	1·47	32·00
C. Nrthumberland	0·49	0·91	26·63

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Feb.	March.			Feb.	March.
Amyton	*	—	—	Greenock	*	—	—
Angaston	*	7	7	Green Patch	*	—	—
Appila-Yarrowie	*	—	—	Gumeracha	*	10	10
Arden Vale & Wyacca	*	—	—	Hartley	779	11	11
Arthurton	*	—	—	Hawker	781	9	9
Balaklava	*	—	—	Hookina	†	10	10
Bandon	*	—	—	Inman Valley	779	—	—
Beetaloo Valley	*	—	—	Ironbank	781	6	6
Belalie North	†	7	7	Julia	*	—	—
Berri	777	14	14	Kadina	776	10	10
Blackwood	778	12	12	Kalangadoo	*	14	14
Blyth	773	7	7	Kanmantoo	*	7	7
Booleroo Centre	‡	—	—	Keith	784	14	14
Borrika	*	—	—	Kingscote	*	6	6
Bowhill	*	—	—	Koppio	776	—	—
Burra	773	6	6	Kybybolite	*	5	12
Bute	*	—	—	Lameroo	*	—	—
Butler	*	—	—	Leighton	*	—	—
Caltowie	*	7	7	Lipson	*	—	—
Canowie Belt	*	—	—	Longwood	781	11	11
Carrieton	*	5	12	Loxton	*	—	—
Cherry Gardens	778	10	10	Lucindale	*	—	—
Clanfield	*	—	—	Lyndoch	*	5	5
Clare	774	6	6	MacGillivray	*	—	—
Clarendon	779	9	9	Maitland	*	8	8
Claypan Bore	*	—	—	Mallala	*	5	5
Colton	*	14	14	Mangalo	*	—	—
Coomandook	*	—	—	Mannum	*	28	28
Coomooroo	771	—	—	Meadows	781	10	10
Coonalpyn	778	—	—	Meningie	*	14	14
Coonawarra	*	—	—	Millicent	782	13	13
Coorabie	776	—	—	Miltalie	*	7	7
Cradock	771	—	—	Minlaton	775	5	12
Crystal Brook	*	—	—	Mitchell	*	14	14
Davenport	*	—	—	Monarto South	*	—	—
Dawson	*	—	—	Monteith	*	—	—
Dingabledinga	*	—	—	Moonta	*	—	—
Dowlingville	*	—	—	Moorlands	*	—	—
Elbow Hill	*	—	—	Morchard	*	—	—
Forest Range	*	5	12	Morgan	*	—	—
Forster	*	—	—	Morphett Vale	*	—	—
Frances	*	6	6	Mount Barker	*	11	11
Freeling	*	—	—	Mount Bryan	*	7	7
Friedrichswalde	774-5	—	—	Mount Bryan East	771	7	7
Gawler River	*	—	—	Mount Gambier	782	14	—
Georgetown	*	7	7	Mount Pleasant	*	9	9
Geranium	*	28	28	Mount Remarkable	*	11	11
Gladstone	*	—	—	Mundoora	*	—	—
Glencoe	*	—	—	Myponga	779	—	—
Goode	*	—	—	McNamara Bore	*	—	—

INDEX TO AGRICULTURAL BUREAU REPORTS—*continued.*

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings	
		Feb.	March.			Feb.	March.
Nantawarra	*	11	11	Sherlock	*	—	—
Naracoorte	*	14	14	Spalding	773	—	—
Narridy	*	—	—	Stockport	775	—	—
Narrung	780	—	—	Strathalbyn	781	—	—
North Booborowie ..	*	—	—	Sutherlands	*	7	7
North Bundaleer	771	—	—	Tarcowie	770	10	10
Northfield	*	3	3	Tatiara	*	7	7
Orroroo	771	—	—	Tintinara	783	—	—
Parilla	*	—	—	Two Wells	‡	—	—
Parilla Well	*	—	—	Uraidla and Summert'n	*	—	—
Parrakie	*	7	7	Utera Plains	*	7	7
Paskeville	*	5	12	Waikerie	*	—	—
Penola	*	7	7	Warcowie	*	—	—
Penong	*	14	14	Watervale	775	—	—
Petina	*	—	—	Wepowie	*	—	—
Pine Forest	*	10	10	Whyte-Yarcowie....	773	—	—
Pinnaroo	*	—	—	Wilkawatt	*	—	—
Port Broughton	773	6	6	Willowie	*	—	—
Port Elliot	*	21	21	Willunga	*	7	7
Port Germein	*	—	—	Wilmington	770	11	11
Port Pirie	*	—	—	Wirrabara..........	770	14	—
Quorn	*	—	—	Wirrega	784	—	—
Redhill	772	10	10	Woodside	*	—	—
Renmark	777	—	—	Wynarka	777	—	—
Riverton	775	—	—	Yabmana	*	—	—
Roberts and Verran..	*	—	—	Yadnarie	*	—	—
Saddleworth	*	20	20	Yallunda	*	—	—
Salisbury	*	3	3	Yongala Vale	*	14	14
Shannon	*	—	—	Yorketown	776	—	—

* No report received during the month of January. + Formal report only received.
‡ Held over until next month.

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ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

March 11th and April 8th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

TARCOWIE (Average annual rainfall, about 15½in.).

December 20th.—Present: 12 members.

Harvesting Machinery.—Mr. J. Burgess read a short paper. He drew attention to several defects in the machinery at present used for harvesting grain, both the stripper and the harvester "hanging off," and there was difficulty in keeping up the speed of the latter when going up hill. The lowering of the combs with the main axle as a pivot resulted in the loss of wheat over the combs, and when they were raised for a high crop the straw did not get back under the beaters. The harvester did not turn out a good marketable sample of wheat Messrs. Symons and Miller contended that the harvester did good work in capable hands. Mr. Walter favored the use of the stripper and motor winnower.

Demonstration Plots.—A committee, consisting of Messrs. J. P. Smith, J. Symons, and H. Dempster was appointed to supervise demonstration and experimental tests to be conducted under the direction of the Branch.

WILMINGTON (Average annual rainfall, 18·26in.)

January 14th.—Present: 15 members and one visitor.

Farmers' Wool Clips.—Mr. Farrell read a paper, in which he said it was a mistake to divide a small clip into a number of different lots. Merino ewes were generally kept by farmers. The fleeces of these should be skirted lightly, all burrs being removed from around the edges. Those heavy in grease should be kept apart from the bright, light, and attractive looking fleeces. If the flock were not large enough to warrant the use of separate bales for pieces, bellies, and locks, they should be put into sacks. Skirting should be carried out on a table made for the purpose. If the wool were only burry about the breech it would pay to remove the burrs, but this was largely a matter of discretion. Where the clip was sufficiently large it was advisable to sort the pieces into two classes. Baling and branding should be done neatly. In reply to questions, the writer of the paper said fleeces should be rolled from the head to the breech. The wool on the back should be hidden as much as possible.

WIRRABARA (Average annual rainfall, 18·91in.)

January 10th.—Present: 21 members.

Water Conservation.—Mr. H. Jericho read a paper on this subject. Dams, he said, constituted the cheapest and simplest method of conserving water where good clay holding ground was available. For household purposes the stone underground tank was best, but was expensive, and considerable difficulty was encountered if it cracked or leaked. Two 3,000gall. galvanized iron tanks would provide a cheaper substitute. Water for irrigation was best secured from subterranean flows by being tapped by a bore, The difficulty was to locate the water, He had no faith in the divining rod, COOMOOROO, January 17th.—MARKETING WHEAT.—Mr. G. B. Lillicrapp delivered an address on this subject. He strongly recommended the system of marketing the grain in bulk, as he considered that as a result the sample of grain sold would be improved. Mr. W. Robertson said bagged wheat sold at 3s. per quarter more than grain in bulk. In any case it would be necessary to bag the wheat in order to take it from the farm to the station. He favored grading. Mr. Cooke thought farmers should be encouraged to market a good clean sample.

CRADOCK, January 10th.—Members discussed the merits of the divining rod, and expressed the opinion that it had been of considerable service in this district.

ORROROO, December 13th.—FLOORS.—Mr. T. H. P. Tapscott described a cheap and easy method of constructing floors for outhouses, verandahs, &c. After levelling the surface, a layer of 2in. of soil, preferably limey, should be put through a coarse sieve, mixed in the manner that concrete was mixed, and then rammed down well. A further layer of soil, 1in. deep, and put through a finer sieve, should be added and treated similarly. Coal tar, brought nearly to boiling point, should be applied with a whitewash brush, and dry ashes sieved on top of this. A cracked flag floor could be improved by the application of tar and fine sand mixed to a thick paste to the cracks, ashes being spread on the tar. Tar with ashes on brick or concrete made a splendid floor.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

MOUNT BRYAN EAST (Average annual rainfall, 16in.).

December 6th.—Present: eight members and one visitor.

HAYMAKING.—Mr. E. S. Wilks read a paper on this subject. Hay for feeding should be cut a little on the green side, he said. When required for sale it should be more matured. Oats, if cut too green, became bitter to the taste. This fodder should always be chaffed. The best hay wheats for the district were Dart's Imperial, Yandilla King, and King's Red. The long-strawed wheats, such as Le Huguenot and Baroota Wonder, required a heavier rainfall and better soil conditions than those prevailing in this district. Good sized sheaves, tightly tied, were preferable, and stooking should be done directly after the binder. Round, upright, and fairly large stooks kept the rain out well, but if the hay were damp at the time of stooking they should be made in the shape of a pyramid. The hay should be carted in cool weather, ten days or more after it had been put into the stooks. The stack should be built fairly high, the heads of the sheaves being outwards after the first layer; every sheaf on the outside should be "kneed." A good sloping roof, with heads out, should be built. If two rails were placed on top, one each side of the centre, and weights hung from these on wires, the stack would not suffer from the effects of the wind until the time it could be thatched.

NORTH BUNDALEER.

December 10th.—Present: 12 members and one visitor.

HARVESTING.—Mr. G. Lambert read a paper on this subject. The harvester, he said, should be well oiled, and if the belts were inclined to slip on the pulleys it was a good plan to have them covered with leather. The machine should be put in gear before being started, and if the belt were given a pull back a sudden jerk would be obviated. If the offside horse were inclined to eat the wheat it should be muzzled. The machine should be cleaned well after each variety was taken off. It was necessary to regulate the blast. If the horses were going slowly more wind was necessary to keep the machine clear. A choke-cutter was very useful. If the belts were thrown off the flywheel each night they would not stretch.

CROSS FERTILISATION OF WHEAT.—This subject was dealt with in a paper by Mr. W. Shadforth. The following is extracted:—"The average man with a knowledge of the natural laws of breeding can safely experiment in crossbreeding wheat, and a more interesting subject to men that are engaged in wheat-growing I cannot think of. It is not necessary at first to carry this out on an extensive plan, but simply to deal with a couple of heads of, say, two different varieties. The idea of cross fertilisation is to establish—(1) A wheat that will produce the greatest average yield per acre; (2) to cross one variety that is of a weak-strawed nature with an equally good yielder with a heavier straw;

(3) to establish wheats that will prove rust resistant. There are, of course, besides these a great many more objects in view, such as producing wheats with a chaff that will thresh readily with machines and yet that will not shake out in the field ; to establish beardless varieties, early varieties, &c. The Government institutions of the different States, and a great many private men, such as Mr. Petatz (of Caltowie), the late Mr. King (of Georgetown), Mr. Coleman (of Saddleworth), and others have done a good deal towards helping the farmers to obtain better varieties. The flower of the wheat plant is made up of the following:—The ovary (immature grain), on top of which is a feathery stigma (this remains on the matured grain as the ' brush '), forming the female part of the flower ; and three anthers (pollen sacs) or filaments (stalks) forming the male part. These two parts are enclosed in glumes, commonly known as chaff. The flowers are arranged in clumps of three to five and are known as spikelets, and these spikelets are arranged alternately on a central stalk to form the head. The anthers burst and scatter the pollen on to the stigma whilst still inside the chaff. As soon as this has happened the filaments grow and force the empty (or nearly so) pollen sacs out of the sheath. This is what is seen on the heads soon after they have left the sheath (or flag). Then one can be quite positive about the flowering inside of the chaff. This accounts for the fact that one seldom gets a naturally cross fertilised wheat, and also admits of growing varieties close to one another, at the same time keeping them pure. Cross fertilising or hybridising consists in removing anthers from a head of the plant being retained as a female and replacing them with pollen from the ' male ' plant. The female plant should have the anthers slightly yellow and the stigma spread out like a feather. In flowers that are too green the stigma is all clotted together like a small paint brush. The anthers from the male plant should have just burst, or be on the point of doing so. When they are near the bursting point they are very yellow and have a full and rounded appearance, and when too green they are pointed and more or less pinched. The middle spikelets on a head of wheat nearly always flower first, and when these are fit to fertilise the bottom ones are always too green and the top ones usually so. This being the case, pull off the bottom two spikelets on each side of the head. To get good results one must hurry, as under good weather conditions (bright, warm mornings) the handling rapidly brings these flowers to maturity. Avoid bursting the flowers in the heads. Utilise only one flower in each spikelet, making sure to pull the others off. This should leave the inside glume (chaff) facing the operator. Both sides treated in this manner means 14 to 20 flowers in each head, and it is so much easier and quicker to do 30 to 40 in two heads than the same number in a single head. *Method of Operation.*—Catch the edge of the ' inner ' glume with forceps and then pull it just far enough for it to remain open. Extract three anthers ; put a recently burst anther from a male plant in the flower and close the glumes together. It is then necessary to have this head wrapped up to keep the glumes closed until all parts have flowered, and the easiest and quickest way to do this is with ordinary darning wool, wrapping up the whole head and leaving it in this state until the heads are picked. It is extremely difficult to fix new varieties."

REDHILL (Average annual rainfall, 16·79in.)

January 13th.—Present : 15 members and two visitors.

Bulk Handling of Wheat.—In initiating a discussion on this subject, Mr. McAvaney said he preferred bulk handling to the present system. He did not think farmers would obtain a better price for bagged wheat as was often stated. At all large shipping centres in England elevators were installed and the bags were ripped open in such a manner as to render them useless in the holds of the ships for convenience in handling. He also commented on the unsatisfactory results of weighing wheat with scales, and mentioned that many farmers were continually complaining of receiving a shortage in weight. Mr. Coffey had examined scales at a certain wheat-buying centre and they had shown a deficiency of 7lbs. He thought a travelling expert should be appointed to inspect scales, instead of the local clerk of council. Members were in favor of bulk handling of wheat.

Early Fodder Crops.—Mr. McAvaney recommended sowing barley, oats, peas, or an early variety of wheat for early feed. This would not only be of great value for fattening stock and lamb-raising, but would improve the condition of the soil. Great loss had been sustained this season through deep drilling. In the majority of cases light drilling gave the best results. Mr. Stone did not think it advisable to sow oats as early feed, as stock did not like this crop in the early stage of its growth. He recommended sowing early wheat, and also peas, as they considerably enhanced the yields from the following crops of wheat. Mr. F. A. Wheaton thought barley best for feed.

WHYTE-YARCOWIE (Average annual rainfall, 13·91in.)

January 12th.—Present: 12 members and one visitor.

Irrigation and Fodder Crops.—Mr. van Senden read a paper on this subject. Lucerne, kale, rape, and chou moellier could be successfully grown under irrigation on fairly rich flats. Silver beet was an excellent fodder for fattening sheep and topping off lambs. In New Zealand a 12 months yield of fodder of this crop weighed 218 tons per acre. It required good soil and plenty of moisture. The best method of watering in this district was to erect a large tank at the windmill, well, or dam, conducting the water through 1¼in. pipes by gravitation to the plots. Standard pipes and taps should be 1in. Shortages of feed just about lambing time could be overcome by the provision of straw stacks, which could be fed with molasses. Small grass paddocks were advisable. Mr. Wittwer said silver beet as a fodder crop was quite new to him. He had tried lucerne, and although the grasshoppers stripped it bare in the early part of the summer there was green picking again now. He strongly believed in conserving fodder in the shape of straw and wheaten chaff. He had been informed on good authority that sprinklers were going out of use in America, in favor of a system of pipes, in which small holes were drilled at intervals. These were laid at a depth of 6in. or so from the surface; in this way evaporation was reduced to a minimum. Mr. McGregor said that, while doubtless it would pay to give attention to these secondary sources of income, it paid better while land was plentiful and labor scarce to give the whole attention to the larger matters. Mr. Hunt doubted if under our conditions silver beet could be grown successfully. Straw and chaff, with molasses, constituted a very useful fodder. Mr. McLeod several years ago had sown lucerne seed with his wheat crop, and there was still a number of plants which provided green picking for stock when it was most needed. The President (Mr. G. F. Jenkins) had found silver beet a very good vegetable, and under garden conditions it grew readily here, and it was not injured by brackish water or cutting. He had had no experience of it as a fodder, but thought farmers often went far afield in their efforts to find a fodder plant suited to local conditions and neglected the one close at hand. The buck-bush (*Salsola kali*), for instance, grew readily, and was undoubtedly suited to the district; if more attention were given to it a large amount of fodder might result.

BURRA, December 19th.—Co-operation.—Mr. F. G. Scholtz read a paper, in which he urged the necessity for farmers to co-operate. Three or four branches of the Bureau, he said, could unite in the purchase of such requirements as cornsacks, woolpacks, twine, super, machine oil, petrol, &c., and by this means effect a considerable saving.

PORT BROUGHTON.—Super. and Wheat.—Mr. Pattingale had tested the relative values of high and low grade super. He applied 20 per cent. more of the latter, and whilst there was no appreciable difference in the wheat crop, the subsequent grazing value of the land was enhanced. Thomas's super., he found, resulted in good heads and little straw. Members discussed the effect of the climate on the wheat. The further north, in good wheat land, the crop was grown, the stronger was the flour produced. Gluyas yielded well in this district, and the sample of grain was superior to that of German Wonder, Marshall's, and other varieties.

Caterpillars.—Mr. Pattingale recommended a mixture of bran, sugar (preferably brown), and Paris green, for destroying caterpillars on tomatoes.

SPALDING, November 21st.—Co-operation Amongst Farmers.—Mr. Hennessy contributed a paper, in which he urged producers to co-operate. Requirements could be then ordered in bulk lots direct from the manufacturers. He commended the practice of farming communities in Germany which issued bonds to the public when members desired to secure loans.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16·46in.)

January 17th.—Present: 20 members and three visitors.

Experimental Plots.—The Hon. Secretary (Mr. W. O. Eime) supplied the following table of the results of the experimental plots carried out on Messrs. Eime Bros'. holding :—

VARIETY TEST.

Variety.	Sown.	Area of Plot. Acres.	Seed per Acre. lbs.	Super. per Acre. cwts.	Average Yield per Acre. bush.	lbs.
Bayah	May 28	5	66	1	14	16
Federation..............	"	2½	66	1	12	31
Firbank	"	2½	66	1	13	39
Crossbred 28	"	2½	66	1	14	38

Figures of a manure test were also given. Mr. Eime remarked that the season had not been good for testing. The wheats used were all early varieties. The Bayah seemed to stand the dry weather right through better than the other varieties. It grew quickly from the start and kept up with King's Early which was sown around the tracks. It ripened later than the King's Early, but about the same time as Federation. The Firbank and Crossbred 28 ripened at the same time as King's Early. These plots were all practically together. The remainder of the paddock (91 acres) was sown with Federation, and averaged 16½bush., sown with the same amount of seed and super. The Yandilla King, with which other paddocks were sown, had 76lbs. seed and 1cwt. super. This, on the cultivated fallow, averaged from 22bush., and the ordinary ploughed fallow yielded 14½bush. to 17bush. per acre. The first sown was the best. In a late-sown paddock there was a plot of 8½ acres of Yandilla King, the seed of which had been secured from Turretfield; 66lbs. seed and 1cwt. special wheat manure, 40 per cent. soluble, were sown, but it yielded only 12bush. All the seed from Turretfield yielded considerably lower than their own, their idea being that Turretfield seed was not so well acclimatised. Mr. A. L. McEwin thought Correll's No. 7 good for hay. It grew very tall, but he favored the Yandilla King, and considered it the best wheat for this district. He generally found the early-sown wheat the best. Mr. J. J. Clarke considered the Yandilla King the best, but he found the late-sown wheat best. Mr. W. Pratt had had King's Early go 10bush., Bunyip 7½bush., Silver Prince 14bush., Yandilla King 12bush., and Marshall's No. 3 10bush. He found the Silver Prince a good early wheat, which grew to a good height, stood up well, and never shook out. He considered it good for hay, and thought the best variety for grain for scrub lands was Yandilla King, but found that out on the plain of Mount Templeton Federation yielded double that of any other wheat. Mr. M. Coleman had found Marshall's No. 3 best for last season. So far as he was concerned it had yielded 3bush. more per acre than other wheats. Mr. T. Roberts also found Marshall's No. 3 best. Mr. C. H. Zweck stated that he found the Yandilla King by far the best.

CLARE (Average annual rainfall, 24·30in.)

December 12th.—Present: 15 members.

EXPLOSIVES.—Mr. E. L. Elliott contributed a paper on the use of explosives. Dynamite, he said, was exploded by a detonator and fuse. The detonator should be made water-tight in order to protect the fulminate of mercury, of which it was composed. In dry places blasting powder could be used. Continuing, the paper read—"This does not require a detonator; simply place about 75 per cent. of the charge in the hole, insert the fuse, then the remainder of the charge, and tamp as tightly as possible. Charges of from half a plug to four or five or up to 100 plugs of dynamite are used, and powder is used in charges from 1oz. to 5lb., 10lb., or 25lbs. I recommend the use of powder in quarrying and log-splitting. When preparing a charge it is advisable to cut the fuse on the slant and crimp the casing with crimping nippers or with a pocket knife. Do not crimp the cap with the teeth; do not use hard fracteur; do not use other than Nobel's explosives and safety fuse, as they are inferior; do not carry dynamite in the pockets; do not allow people who do not understand their use and danger to handle explosives."

HOMESTEAD MEETING.—On December 20th members visited the homestead of Mr. W. Pattullo to inspect the results of the pruning match carried out under the auspices of the Branch during the winter.

FRIEDRICHSWALDE (Average annual rainfall, 18in. to 19in.).

December 13th.—Present: nine members and three visitors.

FENCING.—Mr. G. Grope read a short paper on this subject He thought red gum the best material for posts. They should be not less than 6in. x 5in. on top, and 5ft. 4in. in length. Strainers should be 7ft. long and placed 3ft. 6in. in the ground, being well strutted with a substantial rail placed between the two top wires. Strainers in the fence line need not be put more than 2ft. 6in. or 3ft. in the ground, but should be at intervals of not more than 96yds. Ordinary posts should be 14ft. apart. A cheaper fence could be erected by putting three T iron standards and then one wooden post, at intervals of not more than 12ft. Five plain wires with a barbed wire on top were necessary for a boundary fence. The barbed wire should be fastened to the posts with wire instead of staples. The first wire should be 6in. from the ground, the second 11in., the third 17in. (these being No. 10 gauge), the fourth 23in., and fifth 30in. (being No. 8 gauge), and the barbed wire 39in. from the ground. A space should be cleared around wooden posts to protect them from fire.

FRIEDRICHSWALDE (Average annual rainfall, 18in. to 19in.)

January 10th.—Present: six members.

Engines.—Mr. J. Heintze read a short paper. An engine attached to a winnower, he said, would cost per day 2s. for benzine and 6d. for oil, and thus would save the labor of one hand at 8s. per day. Saving was effected and considerable advantage secured also by attaching an engine to the harvester. When this was done two men could clean and bag ready for market 100 bags of wheat per day.

RIVERTON (Average annual rainfall, 20·48in.)

November.—Present: 17 members and three visitors.

Dairying.—Mr. M. F. Phillips contributed a paper. The average conditions under which dairying was carried on in the Lower North, he said, were not fair to the industry. The cows kept were generally inferior, and they received scant feed and attention. It was a mistake to purchase milch cows from the market without a knowledge of their breeding. He advised farmers to sow a few acres of barley annually for feed for the cows. Two or three animals of good quality, fed and cared for properly, would be found much more profitable than a number of underfed, illcared-for beasts.

STOCKPORT, January 9th.—**Crops in District.**—In pursuance of the Branch's decision to record the results of the harvest during successive years on a particular section, section 225 H.A. was selected as being typical of the land in the district. This was sown on April 20th with Marshall's No. 3 wheat. Small patches of less than a quarter acre in area germinated promptly, but the balance did not come up until the beginning of August. The average yield was about 15bush. per acre.

WATERVALE, November 10th.—**Farm Horses.**—In a paper on "The Care and Management of Farm Horses," Mr. A. S. Davis advised the provision of stables with stone walls and a thatched roof. This should be divided into stalls. Water should be provided in the yard, so that the horses could drink when they desired. Each animal should have a well-fitting collar. The collar of a horse which was susceptible to sore shoulders should be stuffed and lined. The horses should be worked in the same place in the team regularly, and it was advisable to always brush them well.

WATERVALE, December 8th.—**Lucerne.**—Members generally were of the opinion that lucerne could not be grown in this district without irrigation. The ground was liable to crack in the summer. Mr. Holder had sown an acre to this fodder and it appeared to be a failure. The following year he ploughed the land and planted fruit trees, since when he had been troubled to get rid of the lucerne.

Manuring Vineyards.—The Chairman mentioned that as very little rubbish was permitted to grow in the vineyards, the vines did not receive the benefit they formerly secured from the ploughing in of the weeds, consequently he recommended the application of manure

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YORKE PENINSULA DISTRICT.

(TO BUTE.)

MINLATON (Average annual rainfall, 17·41in.).

December 11th.—Present: eight members.

Marketing Wheat.—Mr. J. Boundy read a paper on this subject. He urged the necessity for farmers to thoroughly clean their wheat. A small quantity of foreign matter in each single bag constituted a considerable amount of rubbish when the production of the State was taken into consideration. The combined harvester was the cheapest method of handling the crop, but the sample secured was not as good as that stripped and put through the motor winnower. Well-cleaned wheat, oats, and barley, put into good bags, would secure the best prices. The Hon. Secretary (Mr. J. McKenzie) thought the system of marketing adopted in this State unsuitable to the conditions. Mr. Evans put his grain through the winnower twice. He thought wheat should be sold in two or three grades, according to sample.

KADINA, January 10th.—Samples of wheat grown during the year were tabled by different members. Mr. Correll tabled Late Gluyas and Yandilla King; Mr. Malcolm, Silver King, one portion of which on fallow yielded 30bush. per acre, another 18bush. per acre, and portion on land not fallowed 12bush. per acre; Late Gluyas, on fallow, returned 15bush. to 18bush., and on land not fallowed, 10bush.; John Brown, 12bush. and 9bush. per acre respectively. Mr. Pedlar had secured results as follows:—Lutz, 15½bush.; Late Gluyas, 14bush.; Yandilla King, 14½bush.; Federation, 10bush. Mr. Wiedenbach—King's Early, 12bush.; Late Gluyas, 15bush.; Marshall's No. 3, on stubble, 7bush. Mr. Paterson tabled a sample of oats 6ft. 3in. in height.

YORKETOWN, December 13th.—CARE OF HARNESS.—A paper on this subject was contributed by Mr. R. F. Venning.

WESTERN DISTRICT.

COORABIE (Average annual rainfall, 11in. to 12in.).

December 13th.—Present: 20 members and two visitors.

DEMONSTRATION PLOTS.—Members decided that arrangements should be made to inaugurate three series of experimental plots—one each in Wookata, Coorabie, and Kooringabie—to test two different quantities of superphosphate and two varieties of wheat on fallow and stubble land.

HOME REMEDIES FOR STOCK.—Members discussed at length remedies for different diseases in stock. One member reported the occurrence of a hard lump about the size of a cricket ball half-way up the shoulder of a horse. Mr. Stretton advised painting the swelling with iodine daily for a week. [The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) commenting on the above, stated that the growth was fibrous, and should be cut out if the iodine failed.] Mr. Riddle reported that he had a horse suffering from a skin disease. Small lumps about the size of a pea appeared on various parts of the body. These broke and discharged a light pus, after which the hair came off. [Mr. Place attributed this to digestive troubles, and advised giving ½oz. sulphur daily in food for a fortnight. Boracic ointment to be applied to the sores.]

KOPPIO (Average annual rainfall, 22·40in.)

December 11th.—Present: eight members and three visitors.

WOOL AND SHEEP.—The Wool Instructor (Mr. Henshaw Jackson) gave an address and demonstration. He commented on the smallness of frame of the sheep he had seen in the district, and suggested that the introduction of big-framed Northern rams would make an improvement. For the farmer he advocated breeding crossbreds, using long-wool rams on Merino ewes, on account of the wool of that cross being more profitable. Where suitable conditions existed for growing fodder crops fat lamb raising would be found profitable. Mr. Jackson considered much good fodder was wasted on the farm through farmers not making full use of cocky chaff and stubble; 3lbs. of cocky chaff and ½lb. crushed oats would make a cheap and excellent ration for a sheep when feed was scarce. He had himself conducted experiments in the feeding of sheep. He kept 13 sheep in a small enclosure for 220 days on 1lb. chaff and 2ozs. oil, at a cost of ½d. per sheep per day, and at the end of that period they were fat. Mr. Jackson emphasised the fact that it would pay growers to carefully class their wool for market, but they should avoid over-classing. He then gave a demonstration on skirting and rolling. If no bur or seed were present in the fleece, stained pieces and hairy growth round the breech and neck should be taken off. If there were bur or seed it was advisable to skirt in as far as it extended, and take all stained pieces out of the belly. They should carefully pick over the pieces and divide them into two lots—good clean wool, and dirty or stained pieces, branding each bale plainly on the top and front with the grower's brand and description

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BERRI.

December 13th.—Present: 16 members.

Buildings.—Mr. H. P. Wishart contributed a paper. Frequently, he said, the occupier of an irrigation block selected sites for buildings on any portion of the land unsuited for cultivation purposes, irrespective of whether it constituted the best site for the economic working of the holding. Beauty as well as utility should be considered in connection with the erection of the homestead. Stone or brick was the best material to use. The walls should be high, rooms large, well lighted and ventilated, preferably with a verandah or shelter on every side. Other buildings should be some distance from the dwelling-house. The stables should be large enough to accommodate all the livestock on the farm. Implement, tool, and hay sheds should adjoin. These could be made of concrete consisting of one part lime to two parts sand and three parts rubble, mixed and placed between 12in. boards at the required distance apart. Continuing, the paper read—"A very convenient building or shed for the irrigation blocker is a large roof or covering supported on posts a considerable distance apart, and having at least three sides open; if one is closed it should be the side facing the windy and rainy point. Until such time as the blocker is in the financial position that will allow the construction of a building for each specific purpose this covering or shed could be made to serve as a hayshed, and for implements and tools, including all drying trays, sweat boxes, &c., and could be so fitted for portion to serve temporarily as a stable. The supports and, in fact, the greater portion of timber needed in this shed could be secured locally. The roof should be of galvanized iron. The settler must have some idea of the completed plan of his holding, so that the buildings thereon can be arranged to fit in with all necessary requirements for the most economic and profitable working of his property." Generally, members favored concrete for building, as the material was easily obtainable locally.

RENMARK (Average annual rainfall, 10·93in.).

December 9th.—Present: seven members and five visitors.

Dried Fruits.—Mr. Alfred Odgers read a lengthy and instructive paper on this subject He drew attention to the fact that the consumption of dried fruit in Australia was relatively small, attributing this to the high prices. Prices to the consumer could be lowered if better cultivation were practised. The more general use of gypsum and manure and better pruning were necessary. Labor-saving implements and appliances should be adopted. Continuing, the paper read—"There is yet another great factor that will operate if prices are lower, viz., the export of dried fruits to Europe. Some years ago the representatives of some of the great co-operative societies in England were interviewed whilst in Adelaide, and asked as to the possibility of securing a share of their trade in dried fruits. Because we were unable to supply their yearly requirements, they said there was no hope of doing business. At that time some of them were buying each year from 500 to 800 tons from America and Canada. France and Germany would be large buyers if the prices were right. Both countries would also be large buyers of preserved fruits. For this trade these must be put up in clear white glass jars. The get-up of such commodities has much to do with the demand for them." He recommended special efforts to encourage the consumption of fruit within the Commonwealth by extensive advertising, which could be undertaken by a Commonwealth fruit growers' co-operation. Mr. Muspratt considered one central agency necessary for selling dried fruit, owing to the number of tied stores. Many blocks were planted with trees or vines unsuited to the soil. Returns from the majority of the orchards would be improved with more cultivation and manure. A fair estimate of working expenses was £10 per acre per annum. Mr. Basey thought there were too many grades in grape fruit. Mr. Cuttle said there should be a bulk grade and one other; these should not vary.

WYNARKA (Average annual rainfall, 14in. to 15in.).

December 5th.—Present: six members and two visitors.

Demonstration Plots.—A committee, consisting of Messrs. J. R. Beck, A. Hood, C. B. Wright, J. Boyce, C. Schultz, and C. S. Hall was appointed to superintend demonstration work. Wheat varieties tests were to be undertaken by Mr. Beck, quantities of seed tests by Mr. Thompson, manurial tests by Messrs. Schultz and Boyce, and cultivation tests by Mr. Hall.

COONALPYN, December 12th.—HARNESS.—Mr. R. F. Venning contributed a paper dealing with the care of harness.

SOUTH AND HILLS DISTRICT.

BLACKWOOD (Average annual rainfall, 27in. to 29in.)
January 12th.—Present: 18 members.

THE FRUIT CROP.—Mr. Penno grew only Moorpark apricots. For four years he had good crops; the next year the crop was poor owing to the hail knocking the fruit off the trees. The following year the setting was poor, but this year the trees were carrying a very heavy crop. Mr. James reported that his apricot crop was a failure this year. If there were a good quantity of fibrous roots in the surface soil the following crop of apricots would be heavy; if the fibrous roots were absent the crop would be poor—even if the flowering were good the fruits would fall from the trees. Mr. G. W. Summers reported that he had the Duchess, L'Inconnue, Beurre Clairgeau, and Josephine de Malines pears in consecutive rows, and the crop on the Duchess was poor, while the other varieties carried good crops. Mr. Winser said he had two blocks of Jonathans, one of 250 trees and the other of 400, together with a block of 1,000 Cleopatra, all of which set good crops, but a block of 600 Cleopatras opposite the Jonathans did not set so well.

BLACK SPOT ON APPLES.—Mr. W. L. Summers read an extract from a report of spraying tests carried out at Bairnsdale. The district was very favorable to scab, and there were heavy dews at night several times a week right through the late spring and early summer months, causing the leaves to drip as from a shower of rain. The trees in the tests were very large, being up to 30ft. high, and carried dense foliage. The spraying was carried out in September, when a pinkish tinge was showing in the flower buds. The trees that were sprayed were clean, and those left unsprayed were badly affected with fusicladium, both on the foliage and fruit. The mixtures used were Bordeaux mixture 6lbs. bluestone, 4lbs. lime. 40galls. water; Burgundy mixture—6lbs. bluestone, 9lbs. soda, 40galls. water; verdegris, 3lb., to 40galls. water; and a lime-sulphur mixture. The results were all satisfactory, whether one, two, or three sprayings were given. Where verdegris was used the results were most satisfactory. The comparative cost of sprays per 50galls. was Bordeaux 1s. 10d., Burgundy 2s. 8d., verdegris 5s. Verdegris was used very largely in France. Members were agreed that where apple trees were sheltered the fruit was clean, but where exposed the fruit was dirty, and that early spraying was most effective.

CHERRY GARDENS (Average annual rainfall, 35·03in.)
January 6th.—Present: nine members.

FRUIT TREES.—Mr. A. R. Stone read a paper. He preferred young trees that had been budded to those that had been grafted. When planted out, it was advisable to cut the rough ends of roots that had been damaged in transit, and place the tree on a small mound in the centre of the hole to about the same depth as it was formerly. If the ground beneath the trees were dry it could be loosened by means of explosives. The land should be worked well, and the trees placed about 20ft. apart. Continuing, the paper read—"After planting it is necessary to prune off all the surplus wood or limbs, leaving only the number desired to shape the tree, and in most cases cut to an outside bud. In spring, when the shoots are making a growth, it will be necessary to move the surface to retain all the moisture available, otherwise the land will become baked, dry, and hard, the soil beneath being unable to nourish the roots, and the tree will soon be showing the need of care and attention. At intervals a little later on, especially after rain, it will do much good to hoe, or by other methods move the surface again. During the first year or so young trees have a tendency to make too much top, and with the wind will cause a large space around the stem to become hard and smooth, while the tree is not likely to have a good root system. Summer pruning or cutting back part of the young growth will have the desired effect. A stiff, low tree is better than a tall, slender one, as later on it is not so difficult to gather the fruit. Some varities of fruit trees, chiefly apples, form fruit buds during the first year or two, and often, if not picked, these will keep a limb from the position desired to form a good evenly balanced tree. At planting time a few handfuls of bonedust worked or mixed with the soil around and as far as convenient away from the stem of the tree will cause the roots to extend and develop better than if placed directly on them. Most manures have a beneficial effect upon trees. It is best not to manure close to the trunk, but encourage the roots to spread out into open ground."

CLARENDON (Average annual rainfall, 33·67in.)

January 19th.—Present: eight members.

Fertilisers.—The Hon. Secretary (Mr. A. Phelps) read a paper. He considered it necessary that every farmer should ascertain by experiment exactly which manurial dressings gave the best results on his holding. Different crops also required different applications. When due attention was given these points, and the soil was worked intelligently and selected seed sown, satisfactory returns were practically assured.

Feed for Cows.—Mr. C. C. Spencer had been feeding his cows on lucerne and oaten hay for alternate periods. Best results were secured from the latter.

HARTLEY (Average annual rainfall, 15in. to 16in.).

December 10th.—Present: 18 members and one visitor.

Poultry.—Mr. W. Cross read a paper on this subject. He advised farmers to provide a small shed, with a layer of straw on the floor, on which to feed the hens in winter. A flock of 100 hens necessitated two breeding pens. A pure-bred rooster should be mated with 10 of the best hens. About 120 chicks should be reared annually, as early as possible, to keep up the laying flock, and the old hens should be rigidly culled. In addition to the laying strain it was advisable to keep hens of a good sitting breed. When sufficient eggs for sitting purposes were secured the hens should be turned out, but the male birds should still be kept in confinement. Members considered hens required exercise during cold weather, and, therefore, did not approve of shutting them in houses or yards. Some thought more than 10 hens could be advantageously mated with one rooster.

Dairying and Pig-Breeding.—Mr. F. Bruns, in a short paper, said indifference and carelessness in breeding dairy stock was the weak spot in this industry. Unprofitable cows should not be kept. He proferred the Jersey for dairy purposes, but the best dairy animal was not the best for beef. Cleanliness and regular and prompt marketing were essential. The Essex-Berkshire cross was the best class of pig. Breeding sows should not be kept in small sties, as they required plenty of exercise when in farrow. During the summer they should have water in which to bathe. Members thought the Jersey cow good as a creamer only. The Shorthorn was good for the dairy, and for beef could not be beaten.

INMAN VALLEY (Average annual rainfall, 26in. to 27in.)

December 10th.—Present: 16 members.

Dairying.—Mr. D. A. Norsworth read a paper. Agricultural pursuits in this district were not quite as successful as was desirable on account of the wet seasons, he said. Dairying could be carried on to profit on the best of the land, and the second-class areas could well be utilised for growing fodder for the cows. The cow sheds should have bricked or tiled floors, dipping well, to allow of good drainage. Separate bails should be provided for each cow, as stall feeding would be necessary during part of the year. The dual purpose cow was the best suited to the district, *i.e.*, the Milking Shorthorn. Whatever breed was chosen it should be kept true to type. The bull should not be allowed to roam at large with the herd. Regularity of milking was essential, and testing was advisable.

MYPONGA (Average annual rainfall, 33·33in.).

December 22nd.—Present: seven members and four visitors.

Potatoes.—Mr. K. Stephenson read a paper, in which he related conclusions from experiences in potato culture at Mount Jagged. He said—"In potato-growing three factors exercise a large influence on the success or failure of the crop, *i.e.*, preparation of soil, seed selection, and climatic conditions. We have found from experience that deep cultivation is the best. The ground should be well ploughed to a depth of 8in. or 9in., and, if possible, deeper. It should then be worked with the harrows and roller until the top 4in. or 5in. are reduced to as fine tilth as possible. If the ground is dirty disc harrows will be found far superior to ordinary harrows. The selection of the seed is a matter to which too much care cannot be given. Although some growers will use nothing but large seed cut into sets, we have not found much difference between cut and whole seeds, providing the whole sets are from good plants. As soon as the potatoes shoot they should be picked over, all shoots being removed and tubers of doubtful quality thrown out. The seed should be put in a thin layer on a cool floor in a fairly dark shed. Planting may be done in dry ground in August or September. In the swamps and damp soils December is the best time to plant. The ground should be given a second ploughing to a depth of 4in. to 5in., the sets being placed in the bottom of the furrows. It is advisable to manure at the rate of half a ton per acre; bonedust and guano super. being in our experience the best. After planting, the land should be harrowed and, if lumpy, rolled. When the rows can be distinguished the horse-hoe should be put to work to keep weeds in check. When the plants are 8in. or 9in. high they should be banked up, after which they may be safely left until dug." Members condemned the idea of keeping seed in a dark shed. They would rather have it exposed to light, keeping tubers intended for domestic purpose dark. The practice of broadcasting manure had much to recommend it. Whole seed were more liable to produce runouts than cut seed.

The Hon. Secretary (Mr. F. Müller) also read a paper on this subject, in which he said —"The chief points to be considered are good cultivation, good seed of suitable sorts, sufficient manure of the right kind, and the correct season for planting. The land should be cultivated as deeply as strength will allow. Turning up a little clay will not hurt the potatoes. The soil should be well stirred and the clods crushed. It is preferable to work the land well before planting, as I hold that frequent horse-hoeing injures many roots, and consequently the plants. At the second ploughing after the soil has been well pulverised, plant in every third or fourth furrow. Place the sets not less than 12in. apart, 15in. is better, a little more being allowed for Snowflakes. When the rows are showing well, horse hoe, and later on earth up the crop with mouldboards on the ordinary horse hoe. Good seed is necessary. Select it when digging and keep it pure. To ensure strong hardy shoots at the time of planting, expose the seed to light and air, but not necessarily from the time of digging. Autumn potatoes can be kept in bags until about August and then shot under trees or anywhere out of reach of cattle, pigs, or poultry. A better plan is to keep them on racks or trays one or two deep, but this might prove rather expensive for a beginner. The kinds generally grown in this district are Up-to-Date for early crops, and Snowflakes for late. I find that guano super. does best with us, after a careful test of potato manure, bone super., mineral super, and guano super. Half a ton per acre should be broadcasted and harrowed in before the second ploughing. Broadcasting distributes the manure throughout the soil. It is a well-known fact that the roots run right across from one row to the other in their search for food; they are searching in unmanured soil if the common practice of manuring in the furrow with the sets is adopted. After three years' trial I have determined that November and December are the best months for planting. I am so confident that late planting is a success that I intend planting till the end of January this season. It is inadvisable to plant cut sets in dry ground, as they are liable to dry rot; but whole sets will sprout no matter how dry the soil, and once they are up potatoes can hold their own until the autumn rains set in, or in any case they will have cooler weather in which to mature instead of midsummer, as is the case if planted in early spring. This district produces about 10 times as many potatoes now as it did eight years ago, but the industry is capable and deserving of greater expansion, when we consider the immense quantities imported from Victoria annually, and the fact that one city firm handles about 6,000 tons per annum, shows that it can hardly be overdone. I estimate that we can grow this crop to profit at £4 per ton. We expect to average at least five tons per acre. The cost is no more than £11, made up thus—half a ton manure, £2 12s. 6d. delivered; half a ton seed, about £2 10s. to £3; cultivation, including planting, £3; digging five tons at 10s. per ton, £2 10s., leaving £9 per acre over cost, besides the certainty of the land being benefited by the crop."

NARRUNG (Average annual rainfall, 17in. to 18in.)

January 9th.—Present: 13 members.

Colt-Breaking.—An address on this subject was given by Mr. J. W. McNicol. The colt should be caught and handled when it was weaned, and at intervals of a few months thereafter, he said. At two years old it should be roped, and the operator should gently work up to its head. A halter should be put on, and a rope fastened to the noseband of this. The animal should be lunged from side to side until it answered the rope. It should then be flicked under the forelegs with a light whip until it would walk up to the operator, and lead or follow as soon as the arm was raised. A bit should be placed in its mouth and fastened to the halter with a short strap or spring hook. A surcingle with a ring attached to each side should be put on, and a line run through the rings with one end fastened to each of the rings of the bit. A firm pressure should be kept on the lines and the animal driven round and taught to guide and pull up. A bag should then be placed around its neck, and a strong rope tied around this and attached to a strong post. It should be made to pull back; when it realised that it could not get away it would give up the practice for all time. A strap should then be put around the colt's neck and a rein on to the near side of the bit, running back through the strap on the neck. A quiet horse should be mounted and the colt kept up alongside, a whip being used on to its rump. For riding, the animal should first be mounted in a yard. A firm grip should be taken of the ear with the left hand, the near rein being held tight and the off rein somewhat loose. The right hand should grasp the front of the saddle or a monkey strap, and the operator should get lightly into the saddle. After awhile the animal could be ridden into the open. For driving, it should be placed alongside a quiet horse at first. There was no need to hurry the operation, but the animal should be used a little every day for a week. The mouth should be allowed to harden with the bit. Firm, but not rough, treatment was necessary.

STRATHALBYN (Average annual rainfall, 19·28in.)

January 13th.—Present: 15 members.

Rust.—Mr. J. W. C. Fisher read a paper, in which he related experiences with this wheat disease since it first came under his notice in 1850. In some cases crops which stood as high as the fences turned out utter failures. Whilst the wheat failed, however, oats yielded 25bush. to 30bush. per acre, which demonstrated the advisableness of lessening the risk of complete failure of crops by sowing different cereals. Persistent spring rains, with damp, thundery days, appeared to encourage the development of the disease. Soft strawed wheats were more liable to rust than the more solid strawed varieties. His opinion was that certain atmospheric conditions seemed to be responsible for the disease.

Wool.—A lengthy paper on this subject was read by Mr. A. Beviss. Climatic conditions, he said, had a great deal to do with the condition of the wool. Hot winds and glaring heat tended to make the wool dry and harsh. Exposure to cold and bleak conditions destroyed the yolk. Plenty of good clean water should be available to the sheep in summer. He described in detail the points of a sheep. Culling should be carried out when the animals were 12 months old, and again when two years old. Stud stock should be yarded and tabled at least twice a year. The sheep should be shorn when the " bloom " was on the wool. The operation should be performed on a good clean board. Hand shears were preferable to the machine. After the stained parts had been removed the fleece should be rolled. After any portion of the neck that was not fit to be included with the fleeces had been removed the sides could then be rolled to the centre. Tender, stained, and broken fleeces should be kept by themselves.

HARTLEY.—During the month of January the Branch held four meetings, at which the Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) delivered a course of lectures on (1) The Anatomy of the Horse, (2) Diseases of the Horse, (3) the Cow, and (4) the Pig and Sheep. Members expressed their entire satisfaction with the way in which the subjects were treated.

IRONBANK, December 13th.—**Summer Pruning.**—Mr. R. Coats read a paper. When fruit trees were pruned heavily during the winter, he said, they sent out numbers of unnecessary shoots. These should be pinched off to a length of about 3in. It was sometimes necessary to thin the crop, which should be carried out as soon as the fruit had set. Members generally agreed.

LONGWOOD, January 10th.—**Homestead Meeting.**—Members met at the homestead of Mr. E. J. Oinn. A hand chaffcutter, to which two counter weights had been attached, was found to work well. A good supply of water was secured by constructing a reservoir just below several good springs at the base of a hill. Some fine potatoes were noticed.

MEADOWS, December 8th.—**Breeding and Feeding Horses.**—This subject was discussed at length by members. Mr. Brooks thought this State could breed stallions instead of importing them from neighboring States. The Chairman (Mr. G. Ellis) considered that too little feed was given to foals during the cold winter months in the Hills District. Mr. Phillips had found it profitable to feed foals during the winter months.

SOUTH-EAST DISTRICT.

MILLICENT (Average annual rainfall, 29·25in.)

December 9th.—Present: eight members.

Wheat after Oats.—Mr. Edgcumbe stated that wheat crops on land which had during the preceding season carried oats had, in his experience, been highly satisfactory, and there was a noticeable absence of takeall in them. Members agreed that generally a better yield of wheat would be secured after a crop of oats.

Wool Industry.—Mr. H. F. G. Holzgrefe gave an instructive address. He was impressed, he said, with the immense future before graziers who could grow good wool. He regretted that more interest was not taken in the growing of wool in some districts, and also in the care of sheep and the "get-up" of the clips. A comparison of prices obtained in the various markets clearly showed what a large quantity of inferior wool was sold each year. For instance, in Geelong, only the previous week, the record price of 29¼d. per pound had been realised for greasy lambs' wool, and fleece had reached 20¼d., while the pieces and bellies of the same clip had brought 14¾d. and 13d. respectively. Glancing through the catalogue he had noticed several lots of lambs' wool up to 25d., and fleece from 16d. to 20d. It was regrettable to see dipping operations carried out in a haphazard fashion, and sheep driven along dusty roads almost immediately afterwards. He had known cases of the best sheep in the flock being fattened and sold and the inferior stuff kept for wool. Every man needed to study his own country, but the use of cheap and inferior rams was, in many cases, the cause of so much low-priced wool. He emphasised the necessity for keeping the best lambs every year to maintain and improve the flock. The preparation of the clip for market was of the utmost importance. It was no use trying to deceive the buyer. There had been a great improvement in the sheep in the Millicent district of late years. However, there was still room for improvement. The Chairman (Mr. J. J. Mullins) said the class of country on which the sheep were grazed had a big influence on the wool. The animals should not be allowed to remain too long on unhealthy country which would cause a break in the wool.

MOUNT GAMBIER (Average annual rainfall, 32in.)

December 6th.—Present: nine members.

Sheep and Wool.—Mr. J. Botterill delivered an address on this subject. This year, he said, prices ranging up to 29½d. per pound had been secured for wool. There were several factors to which these high prices might be attributed—(1) The increase in population in Australia, and the consequent increase in consumption; (2) the increase in the purchasing power of the people; (3) and finally, and most important of all, the increase in the export trade in sheep and lambs. At the end of the year 1912 Australia showed a shortage of 10,000,000 sheep, and this seemed extraordinary, coming, as it did, at the end of a period of 10 or 12 good years. The only set-backs were in one district in New South Wales, and another in the northern portion of this State; but this was due to a poor lambing. In South Australia to-day there were 500,000 less sheep than they should have. One factor, as he had mentioned, was the increased consumption of mutton. Ten years ago the weekly yarding of sheep in the Adelaide market was about 3,000. To-day the yarding went up to 16,000, and this large total was all absorbed, either for local consumption or for freezers. Anyone who had watched the market closely would see that last year more sheep were taken for freezing than in any previous year. It was common to see exporters take 3,000, and 10 years ago this was reckoned a good total yarding. A glance at the export trade explained this more fully. In 1888 the total number of carcasses of sheep imported into Great Britain was 400. During last year Australia sent to Great Britain 1,450,000 sheep and 1,900,000 lambs, and New Zealand 3,191,000 sheep and 2,360,000 lambs. These amounted to about 10,000,000, or equal to the shortage reported in Australia in the last 12 months. The demand for frozen produce in England was increasing, and, in addition, new markets were being opened up in Germany and America, and these would absorb many millions of carcasses in the future. He did not see how they were going to cope with the demand under present conditions. It was well to consider that, in the production of cereals, Australia had to meet with the competition of the whole world. In a small country like Italy several times more wheat was grown than in all Australia and New Zealand. In the production of sheep and wool Australia had practically no competition to face. South Africa was making great efforts to build up the industry, but there was a tremendous lot of pioneering work for her to do. In the Argentine he doubted whether they had a serious competitor, or that the Argentine ever would be in wool, although she might be in fats. Too much attention could not be paid to the careful selection of ewes, and the purchase of first-class rams for breeding. Even a man with a few hundred sheep would be amply repaid if he bought good rams. For country that would carry one and a halt sheep to the acre there was nothing better than the Merino-Lincoln cross. The sheep at Coola were practically all halfbreeds. They cut a fair clip, the wool brought a good price, and the sheep brought a big price off shears. The Merino would cut more wool, but the carcass was not so good. There was one essential in regard to crossbreds, and that was to get a big frame. But there was some land not strong enough for crossbreds, and then Merinos should be used. They must get weight in crossbred wool, and this was not possible on light country. Merinos, on the other hand, would grow a lot of wool without much condition. It was questionable whether it would not pay better to grow wool and fatten sheep on much of the land instead of cultivating it. He thought the Government should do more to show the small landholder how to keep sheep. The owners of most of the small farms were brought up to agriculture alone, and in sheep-raising they had to get their experience somewhere, and it was costly if they had to buy it. A lengthy and interesting discussion followed.

TINTINARA (Average annual rainfall, 18·78in.)

October 25th.—Present: 19 members.

Fruit Culture.—Mr. Max Scott read a paper under this heading. He advised intending growers to plant the trees in well-worked fallow. Cultivation between and across the rows should be commenced immediately the trees made headway; this would assist in conserving moisture. Many horticulturists adopted the practice of planting the trees on crowns made by throwing two single plough furrows together from opposite directions. The earth was then hilled up and firmly stamped around the butt. These furrows also collected a large amount of water during the wet season. Peas at the rate of 2½bush. per acre, should be sown and ploughed in green before the trees were planted. If the latter were not making satisfactory progress during the first year, half a pound of nitrate of soda could be applied to the base of each, or the same quantity of a mixture consisting of 1cwt. chloride potash, 2cwts. sulphate of ammonia, 5cwts. concentrated super. Stable manure could also be used to advantage, about two wheelbarrow loads being placed at the foot of the hill around each tree and ploughed in during the following year. Stringent steps should be taken to prevent the introduction of codlin moth to the district.

Melilotus.—Mr. A. Koeppen Wendt reported having visited the district of Rye (Victoria) where the cultivation of melilotus was largely carried on. Captain Hill, who went in for this fodder on a considerable scale, he said, "Considers this a splendid pioneer for cleaning the land; but later on other fodders can be grown to better advantage. Mr. Norquay thinks that it cannot be improved upon in that district. I inspected some of Mr. Norquay's melilotus paddocks. The land was originally dense teatree scrub. The soil consists of about 2ft. of black sand on top, under which is yellow sand. It is prolific in phosphates and lime, but deficient in potash. The method of sowing in this district is to burn the standing scrub in February and then to broadcast the seed as soon as possible after the burn. Most of the scrub is killed by one fire, and seedlings are practically the only subsequent growth. These are killed when the melilotus is fired the following year. The seed is sown at the rate of about 15lbs. to 20lbs, per acre, early in February, so that it lies exposed to the sun and heat, thus melting its waxy encasement and leaving it in a fit state for germination with the first rains. The first year the melilotus comes up very thin, but if this is fed off lightly and allowed to seed the crop next year should be thicker. This fodder has splendid fattening properties. At Rye, one paddock was carrying a bullock to two acres. Notwithstanding this the melilotus was about 2ft. high. To get the best results from a paddock of this fodder it should be burnt at least once every two years, as a good burn ensures a good germination the following year. In my opinion melilotus should thrive on these fertile downs. Small plots have been grown by different farmers with great success, but they have not received fair treatment. One of the greatest advantages of this fodder is that it can be sown on land not yet clean, as by burning it every year shoots, &c., are destroyed. It also belongs to the leguminous family, thus supplying nitrogen to the soil and improving the fertility of the land. By grazing it all the organic matter from the droppings is obtained, so that land which had been under melilotus for four or five years should be in tip-top condition and produce excellent crops. The sooner the farms in this district are able to carry stock and are manured through this medium, the sooner will really good crops be grown."

KEITH, January 10th.—DEMONSTRATION PLOTS.—A committee, consisting of Messrs. Redpath, Makin, and Gill, were appointed to superintend the experimental work to be undertaken by Mr. Makin.

HUNDRED OF PENDLETON.—Mention was made of the fact that very fine crops of onions, potatoes, and wheat had been grown in this hundred.

WIRREGA, November 29th.—WHEAT.—Mr. P. Prime read a short paper. The best varieties of wheat for this district, he said, were Dart's Imperial, Lots, Gluyas, and Federation. The latter was rather short, but yielded well. Floor pickled graded seed should be sown, and where a good stubble burn was secured 50lbs. to 60lbs. of manure was sufficient, this being increased to from 75lbs. to 90lbs. in later years. Crops on light land should be rolled.

* * *

Wheat Stacks, Port Wakefield.

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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Farmers' Conferences.

Conferences under the auspices of the Agricultural Bureau will be held at Orroroo (Upper Northern Branches) on March 20th, and at Millicent (South-Eastern Branches) on March 25th. The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), will deliver the opening addresses at both of these conferences. Other speakers will be the Director of Agriculture and the Government Veterinary Lecturer, at Orroroo, the latter dealing with "The Importance of Water in the Diet of Stock"; and at Millicent, the Director, the Superintendent of Agriculture in South-East (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.), and the Government Dairy Expert (Mr. P. H. Suter). Professor Lowrie will deal with "The Cultivation of Fodder Crops," Mr. Colebatch will speak on "Lime in Relation to South-Eastern Soils," and Mr. Suter will speak on the "Feeding of Pigs for the Production of Bacon and Pork."

Fruit Export to Java.

The Consul for Netherlands has forwarded to the Department of Agriculture for the information and guidance of fruit exporters to Java an outline of the regulations proposed by the Netherlands Indian Department of Agriculture, etc., governing the importation of plants, fresh fruit, &c., from abroad. In connection with the above, the date of inception of same was February 1st, 1914. All consignments of fruit must be in new cases, and accompanied by a certificate signed by an official expert of the Government of the country of origin, in which is stated that the consignment concerned when shipped from Australia was free from fruit flies and other injurious insects, and diseases. The goods will be inspected on arrival by an official of the Netherlands Indian Department, and if found to be diseased will be rejected and destroyed. Fees will be charged for inspection on arrival, and the usual penalties for any infringement of the regulations are set out. Only certain ports will be "ports of entry" for fruit. The Department of Agriculture has taken steps to obtain copies of the regulations, and when forthcoming the details will be made public.

Agricultural Labor in England.

At the instance of the Dominions Royal Commission, the British Board of Agriculture recently investigated the question of migration from rural districts in England and Wales. The report of the board, which was issued in December last, states, *inter alia*—" It is evident that at the present time considerably more men could find employment on the land than are now available. There certainly appears to be a fairly general deficiency of skilled farm hands. The manual arts of agriculture are being neglected, even by those who still seek employment on the land."

Pollination of Fruit Trees.

At the present time some fruit experts are greatly engaged in relation to the pollination of fruit blossoms. Certain varieties of many kinds of fruit do not bear fully, if at all, when self-pollinated. They require the pollen from another variety to fertilise their blossoms. The work of transferring pollen from one variety to another is mainly done by bees and other insects, but the limit of distance at which this work is done effectively is uncertain. Also unsettled is the question as to the extent to which pollen is carried from one variety to another by wind. The experiments to test these points have been carried out only on a limited scale, and there seems to be more positiveness in asserting the conclusions based upon them than they warrant. It is not certain that the method of testing self-pollination does not in some way tend unduly to negative results, and by far the best test is that of the observation on an extensive scale of the cropping of the several fruits when in large blocks of the same variety, as compared with their cropping when another variety is near them.

Science and the Farmer.

In the course of a recent lecture on " Modern Science and Modern Agriculture," Professor Ainsworth Davis, Principal of the Royal Agricultural College, Cirencester, said that among the results of the scientific study of the soil was the discovery of the bacterial nature of the process of nitrification. On the other hand, denitrifying organisms were also discovered, and the problem was to destroy the latter without detriment to the former. More recently Dr. Russell and his colleagues at Rothamsted had found that partial sterilisation of the soil was followed, after a short interval, by a marked increase in fertility. The theory put forward was that the soil contained microscopic animals which preyed upon the nitrifying bacteria. These animal organisms were destroyed by sterilisation, which at the same time was not sufficient to destroy the bacteria. Notable work had also been done in the production of new varieties of crops. At Cambridge the application of Mendel's theories had borne fruit in Professor Biffen's experiments in the crossing of varieties of wheat, and the production of a wheat that had immunity from rust combined with strength and yield. The next development that agriculturists would look for in Mendelian research would be the production of a good potato free from potato disease.—*Agricultural Gazette.*

Australian Wine in England.

In his report dated London, January 2nd, the Trade Commissioner states :—“ I understand that it is likely that the English Government will consider a suggestion from the Portuguese Government in regard to prohibiting the admission of any wine coming into this country under the name of “ Port ” excepting it comes from Oporto. In consideration of the English Government agreeing to this proposal, the Portuguese Government will put England under their favored nation clause in regard to the admission of woollen goods into Portugal. So far as this particular variety of wine is concerned, this treaty is of little consequence to Australia ; but if this is conceded to Portugal it is probable that France may come along with a similar suggestion in regard to Burgundy, a contingency that would materially affect the sale of our wines in this country, at any rate for a considerable time.”

Of Interest to Sheepowners.

Mr. Henshaw Jackson writes as follows :—

A few ewes of undeniable breeding and correct individual merit are more to be desired than a lot of inferior ones.

It will pay beginners in the sheep and wool business to visit the best breeder within ordinary train distance. Try and have a day or two on his property, and a few hours' personal conversation with the breeder himself. You will probably learn a good deal that is impossible to put on paper.

Small sheepbreeders might do worse than visit each other occasionally. Even if there is nothing to learn, it is interesting to see how others do things, and to compare notes. Such visits would bind interests, unite efforts, and impart benefits from the experience of others.

Plenty of new ideas can be gleaned relating to breeding and feeding. The breeding of livestock is a much greater work than is supposed by those who have never tried it, and there is no royal road to success. Many are called to it, but few are chosen. The sheep-breeding industry needs a bigger number of steady breeders desiring to improve their own flocks and raise the sheep standards of the State. It needs less of those gentry who dash in with a few thousand sheep and hope and expect to make their piles in a couple of seasons.

As a steady line, sheep on the farm are more profitable than any other animal on four legs to-day. When founding a flock don't regard it as a golden hole, to be worked for so long. Rather view it as a life's work, and strive to attain your ideal, even if it takes a long period of years. There's a good living in it while you are striving.

Sheepfarmers should endeavor to have good drafts of fats through the year as well as a good clip. The former have a marked effect on the size of your income.

Poorly-kept sheep don't have prime lambs, or help to make their owners any richer. The best way to improve the prospect for lambing is to give proper attention to the ewes.

If you have a seedy or "off-looking" sheep in your flock, put him into hospital paddock. Find out what ails him if you can; if you can't, look after his skin.

A sheep with dry and pale impoverished skin will never produce a good fleece.

Young sheep are generally the most profitable wool producers. Breed only to first-class rams, and according to your ewes so will you get good, better, and best in the lambs.

A sheep producing a good fleece is also not far out of it in the goodness of the mutton he will kill into.

Fodder that produces good bodily growth also aids in bringing a good fleece to the shearing board.

A good way to mark dogs which prowl round on sheep-killing expeditions is to cut off their tails—close up to their ears!

Shearing.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

"H. K.," Fords, asks for advice as to treatment of a foal suffering from navel or umbilical rupture.

Reply—Generally this form of rupture is best left alone till the foal is about 8 months old, when it will often have disappeared ; if not, the foal should be starved over night and tied upon his back, the skin over the rupture drawn tight, and the bowel returned into the belly. Two skewers should be placed crosswise between the belly wall through the skin, and between them and the wall about 3ft. of saddler's waxend should be wound tightly round the intervening skin, which, with the skewers should be left to slough off, during which time nature will have closed the rupture hole with fibrous tissue.

"J. F. S.," forwards portion of fleshy substance cut from under throat of 5-months-old foal which died. A living foal has the same growths. He also asks treatment for draught mares which were scoured for few days and then went stiff in legs and had labored breathing. The mares have been stinted, and also have foals suckling. He asks the Veterinary Lecturer to pay him a visit to investigate cause of trouble.

Reply—(1) The growths received are the natural thyroid glands which exist in every horse, and when removed the animal dies. In this case they are somewhat larger than normal, showing that they have to work harder than they should in their duty of regulating the animal's development; in other words, the mare during pregnancy did not receive proper nourishment either in quality or quantity, or both. They must on no account be removed from the living foal, but it should receive twice a day two teaspoonfuls of Parrish's chemical food for a month or so. As this has a sweetish taste it will probably eat it in a little bran, or it may be put into its mouth. (2) The symptoms of a complication of influenza and blood worms. The mares are working. suckling foals, and in foal, "Puir beasties." In all cases where the services of a veterinary surgeon are required, application should be made direct to the Chief Inspector of Stock, Adelaide, who has a staff of officers. The Veterinary Lecturer's engagements, made several months ahead, entirely prevent his attending special cases, although when he is in a district his services are willingly given to stockowners who desire advice as to the hygiene and sanitation of their animals ; but the veterinary officers of the Stock Department have the sole control in cases of disease, and much time is saved by carrying out the requirements of the Stock Diseases Act and communicating directly with the Chief Inspector of Stock, Adelaide, and the nearest Inspector of Stock—in this case at Gladstone.

"J. H. V.," Eyre's Peninsula, has a horse which, from symptoms described, is suffering from bloodworms. He asks for treatment.

Reply—Two teaspoonfuls of Fowler's solution of arsenic once daily in a little bran for a fortnight, also 1 dram sulphate of quinine in a little bran twice a week for six times. The drugs are obtainable on the Peninsula.

"J. C. H.," Booleroo Centre, writes for medicines for bloodworms, white worms, water trouble, and sand.

Reply—The Agricultural Department does not dispense or order medicines, but those recommended for the above diseases are :—Bloodworms—liquor arsenicalis (Fowler's solution), two tablespoonfuls once daily for a fortnight. White worms—1 pint raw linseed oil and two tablespoonfuls of ordinary turpentine given once on an empty stomach. Water trouble—¼ pint gin, 20 drops essence of peppermint in ½ pint of warm water. Sand—a quart of new milk and 1lb. honey, preferably on an empty stomach.

The Myponga Agricultural Bureau seeks advice regarding a horse which has cracks across legs just a few inches above fetlocks, reaching towards the hocks, causing the animal to raise his legs something like in the case of stringhalt, except that he throws his feet outward more than with stringhalt, very awkward at backing, and seems too uneasy to be worked.

Reply—The trouble appears to be erythema, due to blood being out of order. Give ½oz. sulphur in food daily for a fortnight, and dress legs daily with petrol 1 part, olive oil 8 parts.

"A. D." has a mare which had a wound between hoof and the hair on hind leg. She became very lame, and swelling of doughy nature extended to under belly. When the swelling was lanced there was very free discharge ; the opening was syringed with lysol, and there was marked improvement in animal's condition, but she still has slight swelling on hock.

Reply—This was blood poisoning from what was possibly a stake in the foot, extending along the large lymphatics of the leg and body. Probably hot fomentations, with a lump of washing soda in the water, will reduce the hock.

"A. V. N." asks treatment for cow which, two months after first calving, blood appeared in milk of hind quarter intermittently ; after four months the other hind quarter also became affected.

Reply—The blood is due to a break down of the structure of the gland, and may be due to some disease, such as tuberculosis, or possibly only to glandular weakness. It would be necessary for a veterinary surgeon to see the cow before a definite opinion could be offered; in the meantime, bathing the udder with a hot decoction of wattle-bark after milking, and give 10 drops of tincture arnica twice a day in the mouth for a week or so may afford relief.

"W. K." had draught mare which died after intermittent colic, suggestive of wheat gorging. The animal was relieved by soda and ginger, but sat up like a cat; the pain increased after eating, and she strained badly. The *post mortem* showed sand in bowel and patches on stomach like old scars; a few long round worms were found.

Reply—The stomach trouble caused the mare's death; the scars resulted from worms which live the first part of their lives in stable and house flies, which both breed in horsedung. Treatment was good, but only mashes should have been given, and a sedative like chloral hydrate 1oz. might have helped. The worms, *Ascarides megalocephalœ*, were only accidents, the almost microscopic ones, *Habronemata microstomata*, doing the mischief. The long round ones may be moved by any purge, such as an aloes ball or a pint of raw linseed oil and two tablespoonfuls of turpentine, preferably given on an empty stomach.

"W. H. S." inquires concerning mare in splendid condition which had one foal, now a yearling. Foal was weaned off and away from dam for months till a few weeks ago, when it started to suck again, the mare not objecting. About a month ago mare's udder and belly swelled. Epsom salts were given, the udder fomented with Condys, and carbolised vaseline applied. There was a mattery discharge from udder, which is still swollen, and the mare is lame in off hind leg. She is in foal.

Reply—Probably an attack of influenza caused the symptoms, which were aggravated by foal sucking. Try 10 drops of veterinary tinct. arsenicum twice daily in the mouth, and foment the swollen parts and inside the thigh with tinct. arnica 1 part, hot water 20 parts; also twice daily light feed, preferably green.

"T. P. D." asks—(1) Cure for sow eating young. (2) Best means of getting rid of "scavenger" ants.

Reply—(1) Fatten her off and kill her; or, if this is too drastic, give plenty of cinders in feed during pregnancy, and ½oz. of sulphur twice a week. The cause of the habit is generally indigestion arising from the fact of being in pig. Sometimes it is a mania. (2) Boiling water is the best exterminator, or kerosine; rings of tar on their runs restrict their travels.

"J. A. J.," Numaroo, asks treatment for draught mare which for 12 days had been continually lying down, and was uneasy and appeared in pain after drinking. She had lost her appetite and fallen off rapidly from good condition to poor.

Reply—The symptoms are those of sand, and it will be well to drench the mare with a pint of new milk and a pound of honey ; repeat in two days if necessary. Rub the flanks vigorously every day, and feed on bran mashes only. Give veterinary nux vomica 10 drops morning and evening; also a good big enema once, of several gallons of warm soapsuds.

"C. R. H.," Streaky Bay, requests treatment for horse suffering from what apparently is "poll evil."

Reply—Surgical treatment alone will effect a cure. The swelling must be opened and probed, the pipes or sinuses cut down to the bottom, and any black, foul-smelling tissue, diseased bone or ligament entirely scraped away, the greatest care being taken not to injure the spinal cord which is exposed at the poll. Then the horse should have the wound irrigated with cold water for an hour a day ; brackish or salt water will do. At the end of the irrigation the wound may be dressed with tinct. arnica 1 part, methylated spirit 20 parts. If the wound is treated to the bottom, a cure will ensue in about two to three months.

Agriculture.

"S. P. D.," Jamestown, states that on his farm are some salt or magnesia patches on which he tried to grow wheat, but failed. He asks for an opinion as to whether oats or barley would grow on them.

Reply—Whether any of the cereals will grow on your alkaline patches depends, of course, on the total amount of alkali present. Both oats and barley will withstand a total amount of alkali much greater than wheat will tolerate. In the case of barley, it can withstand about half more than wheat ; and oats, if anything, are more tolerant than barley.

"W. A. M." asks how to eradicate Cape tulip.

Reply—If the land infested with Cape tulip be arable land, it should be repeatedly and persistently ploughed deeply, and cultivated deeply after each ploughing, with, say, a spring tooth cultivator, to work the underground stem or cone to the surface. This excessive working in dry weather would be to the disadvantage of the first wheat crop following, but to get rid of the pest it should nevertheless be done systematically and thoroughly for one or even two years on the places infested. On non-arable land the plant should be grubbed up by hand thoroughly and the stems burned ; and in every case the plant should be prevented from vegetating and flowering, so as to exhaust the vitality of the root system, underground stem, or cone, as the case may be.

"C. R. H.," Streaky Bay, asks what is the best preparation for very smutty wheat required for seed.

Reply—It is foolishness to sow very smutty wheat under any circumstances, however pickled, unless it be a small quantity of some special variety that you do not wish to lose, as the pickling, under the circumstances, has to be so strong that the percentage of germination will be affected. Thorough pickling with a 2 per cent. solution of bluestone would prevent smut, but a percentage of the grains would be killed.

SOME PARASITES AFFECTING FARM ANIMALS.

By F. Murray-Jones, L.V.Sc., Veterinary Department.

(*Continued from page* 712.)

THE PALISADE WORM (*SCLEROSTOMA EQUINUM*).

This is one of the commonest and most harmful worms found in the horse. It is widely distributed and found all over the world. It is generally found in marshy land. Its length varies—in the male, from ¾in. to 1½in.; female, ¾in. to 2in.; roughly about 20 times as long as thick. This is a most dangerous worm, affecting the horse. Sometimes it causes death by anæmia, aneurisms, and peritonitis, to say nothing about predisposing influence in relation to absorption of toxic substances from bowel.

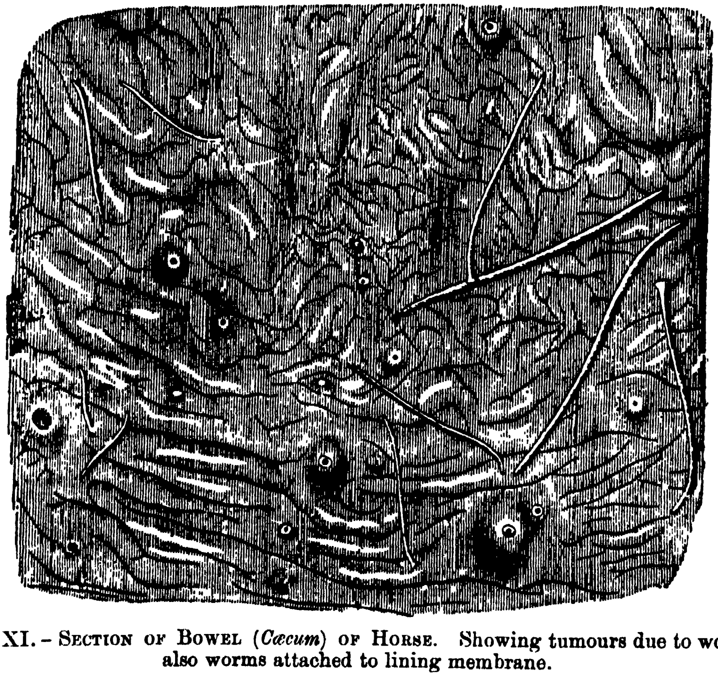


Fig. XI.—Section of Bowel (*Cæcum*) of Horse. Showing tumours due to worms, also worms attached to lining membrane.

It generally exists in two forms in horse—one the adult stage, when it is found in the mucous membrane of the large intestine, *i.e.*, cæcum and colon;

and in the immature stage, when it is often found in the blood vessels, especially in large trunks supplying the intestines with blood. Here it may cause the gravest of injury, and a condition often responsible for the death of the animal. In this stage it is occasionally found in the substance of brain and liver, &c. It is common experience to get the large intestines studded with them. They are often found together in couples. A horse gets infected, as a rule, by contaminated drinking water, or in damp fodder. The embryos, or immature worms, eventually reach the bowels and bore their way into the lining membrane, and cause thereby a cystic tumour. They are very small, about size of a pin's head. It is here that the worm is developed. After developing, the worm travels, some going into the intestine and attaching themselves to membrane, and afterwards producing eggs which are eventually expelled to the outer world with the manure. These eggs eventually become hatched in damp dung or water in from three to eight days. The embryos produced are about one-sixtieth of an inch long. They have a blunt head and a thready tail. However, by no means

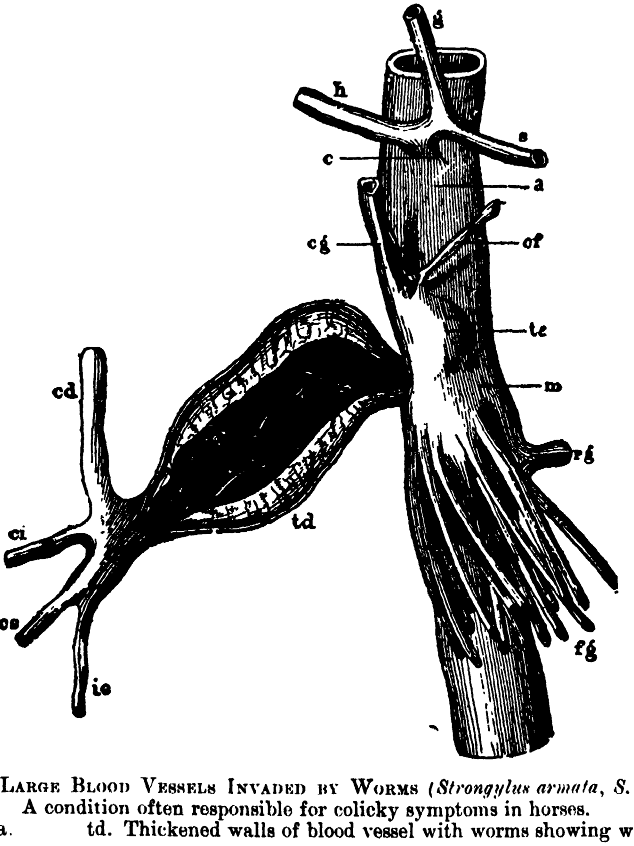


FIG XII.—LARGE BLOOD VESSELS INVADED BY WORMS (*Strongylus armata*, *S. equinum*). A condition often responsible for colicky symptoms in horses.
a. Aorta. td. Thickened walls of blood vessel with worms showing within.

do all the worms leave the cyst for the intestine. Some get into small blood vessels, and reach that part which supplies the intestines with blood. They set up inflammation, and a sac is formed by the bulging of the blood vessel wall. These sacs often reach the size of a man's two fists. The wall of this sac gets thickened as the result of an inflammatory exudate and a fibrous deposit, although a channel is still left open for blood to pass along. These sacs are called aneurisms, and the clot forming in them a thrombus. In the centre of the clot one may find a number of worms (as shown in our illustration) ½in. to 1in. long. Very often an animal so affected may suffer colicky pains, and this may be due to a breaking away of small bits of the clot and so obstructing the blood supply of the intestine. A condition of bowel paralysis of the wall may result. These aneurisms are generally found in the aged animals. If a sac ruptures, hæmorrhage would follow and the animal would die.

TREATMENT.

When in blood vessels treatment of little avail. In intestines, give ½ dram dose of tartar emetic with 2 drams iron sulphate as powder in food once daily for four to five days. Stop for three days and then resume. Follow up with 1pt. linseed oil. Fowler's solution of arsenic may be given—tablespoonful twice daily in food or water for adult; treat for 10 days. Teaspoonful for foals. Thymol in powder with sugar in 15gr. doses, given sprinkled in food once daily for a week. Foals, give 9grs. to 10grs.

FILARIIDÆ.

Spiropteras.—This is a variety of worm belonging to the group of *Filariidæ*. There are three varieties—*Spiroptera megastoma, Spiroptera microstoma, Spiroptera reticulata.*

The *S. megastoma* is generally found in the stomach of the horse, and cause the formation of fibrous tumours below the lining membrane of the stomach. Occasionally the wall of the stomach becomes eroded, and results in a small rupture. The result of this is a condition of peritonitis and death. The worms are about 18in. long; very thin and spiral shaped. Infection is by the alimentary canal.

S. microstoma is generally found in stomach of horse, but usually only in the surface of the lining and not below.

S. reticulata is occasionally met with in the flexor tendons or suspensory ligaments of the fetlocks, and may cause a parasitic growth.

TREATMENT.

The only advice under this head is to follow the broad lines of preventive treatment already set out for other parasites.

BOTS (*GASTROPHILUS EQUI*).

Under the heading of " Parasites of Farm Animals " it will not be amiss to mention the trouble familiarly spoken of as the " bot fly trouble."

Now the fly responsible for the stomach bot met with in horses, &c., belongs to the order *Gastrophilæ*, and is named *Gastrophilus equi*, whilst the bot in the stomach is the grub or larvæ. Now the common grub is too well known to need any further description beyond referring the reader to the illustration in this article. The only object in dealing with this subject will be to offer a few suggestions as to the best way of dealing with the trouble, more especially from a preventive standpoint. Firstly, the presence of bots in a horse's stomach, providing they are not too numerous, need not cause any special alarm. When they are present in great numbers they may interfere with digestive processes, but as a rule they are apparently productive of little or no inconvenience to the animals.

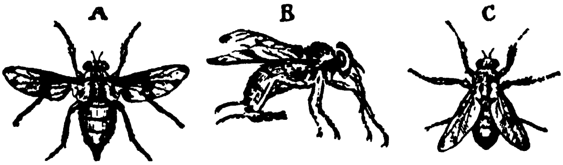


Fig. XIV.—Bot Flies (*Gastrophilus equi*).
A. Female, dorsal view. B. Female, in profile. C. Male, dorsal view.

The method of reaching the stomach is as follows :—The fly deposits her eggs between the months of November and February, generally more plentifully during hot, dry weather than when cold and damp. The eggs are deposited in regions of throat between the jaws, flanks, shoulder, and forearm. They are affixed to hair by a sticky fluid deposited by fly. (The illustration

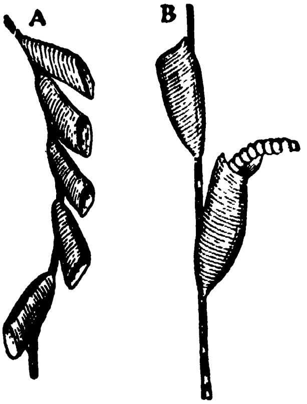


Fig. XV.—Eggs of Bot Fly Deposited on Hairs.
A. Eggs. B. Larvæ just hatching.

depicts the mode of arrangement on hair.) The eggs may reach the stomach by the animal licking, or, a most common way, by means of food. These reach food in manger as result of animal rubbing or scratching the neck on the edge of manger or feed box, the eggs being detached and falling into food. Having reached the stomach, the covering of the egg is dissolved by the action of the stomach juices, and is followed by the liberation of the bot grub. Here the bot attaches itself by means of armed hooklets to the mucous membrane of the stomach. It remains here for several months, to be followed by the next stage of development, namely, the chrysalis, which is ejected with the excreta. The next stage is the evolution of the fly. The fly in turn lays her eggs, and once again the cycle is repeated.

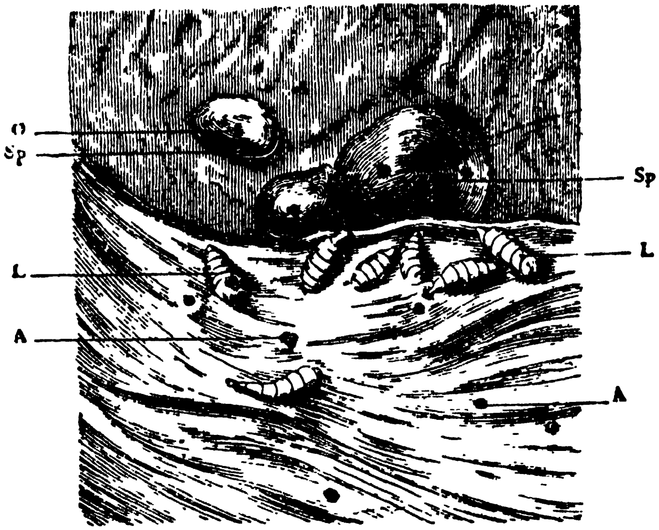


Fig. XIII.—Spiropteral Tumours, caused by Spiropteral Worms; also Larvæ of Bots Attached to Lining Membrane.
Sp. Tumour. L. Larvæ of bots. A. Punctures caused by bots.

TREATMENT—PREVENTIVE.

From the end of September attention should be directed to the animals in order that the special parts referred to shall be the least favorable for the deposition of the eggs by the fly. Firstly, clip the hair as short as possible in the region of throat between the jaws; follow this by singeing. Sponge the throat, shoulder, forearm, and flanks twice daily once before and after work with the following mixture:—Linseed oil (raw), 1pt.; oil of tar, 2ozs. This not only destroys the eggs, but tends to prevent the fly depositing the eggs. Kerosene is often used, but the objection to this is that it tends to irritate the skin, and that it lacks a necessary oily character. Another mixture for smearing is sweet oil, 1pt.; turpentine, 4ozs., or even eucalyptus may be used.

INTERNAL TREATMENT.

Bisulphide of carbon, 1 dram doses given in protective gelatine capsules three times daily before food. To be given two days in succession. Follow up with a pint of linseed oil. Or tartar emetic, ½ dram doses mixed with food three times daily, given for seven days.

GENERAL PRECAUTIONS.

The general cause of parasitic infection is undoubtedly directly traceable to infected pastures and contaminated food and water supplies. Therefore, if any good is to be hoped for in coping with these invasions, combined efforts will have to be directed along the line of purifying and preserving these sources. The land becomes fouled through the droppings from infected animals. The rains following, carry the eggs or larvæ down the watercourse, and so results in fouling the water supply, especially where that supply is from dam or well water.

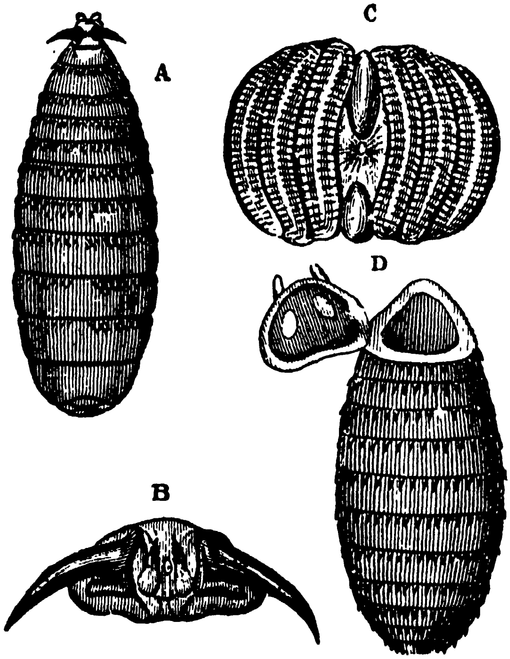


FIG. XVI.—LARVA AND PUPA OF BOT FLY (*Gas. equi*).
A. Larva in third stage. B Showing mouth and hooks. C. Tail stigmatas.
D. Pupa with operculum or lid.

The question is what can we reasonably do with those parts so infected? Parts that we know by experience year after year to carry stock badly infested with one or many varieties of this pest. The first step to be taken must be in the direction of providing a purer water supply, and so thereby reduce the chances of infection by this means.

Much attention is being given to this matter at the present time by Professor Rothera, of the Melbourne University. He recommends the use of chemicals as against filters. Infected or impure water contains a large amount of foreign substance suspended or floating at different degrees of depth. Contained within this suspended matter we find also the eggs of many of the parasites floating. Professor Rothera recommends the adding of certain chemicals to this water, and by the weight and chemical action of combining with these foreign properties to carry them down to the lowest level and beneath the ordinary depth of infection. The means he uses is that of chloride of iron. One pound of chloride of iron to 1,000galls. of the thickest of impure water is sufficient to carry down all the impure mud, &c., 7ft. in one night. The method of using it is to dilute your strong solution of chloride and sprinkle it on the surface of the water. I would suggest the following measures :—

1. Attention to water supply.
2. Cultivation of infected paddocks.
3. Treatment of animal excreta.
4. Periodical medicinal treatment.

1. The fencing of any waterholes and dams would prevent animals puddling and fouling with excreta. The elevation of water to storage tanks by means of pump or mill erected overhead; this can be done at a relatively little cost. Add to this supply chloride of iron in the proportion of 1lb. to 2,000galls. The erection of water tanks to water cattle from. The supply pipe to the trough may very easily be provided with a piece of flannel through which the water might percolate before entering the trough. This could be removed frequently and burnt, in order to destroy any arrested larvæ, &c.

2. Breaking up and turning of infected soil. Dressing with salt and lime. In low-lying land, efficient draining.

3. Treatment of all animal excreta with salt and lime before applying to soil and, in the case of animals reasonably believed to be infected, the total destruction of all manures by burning.

4. Periodical treatment of animals, especially those in suspicious districts with worm-expelling medicines. It is well to remember the young and immature animals are more vulnerable to parasites than are older animals; so it is wise to build up their resisting powers by good feeding, *e.g.*, with lambs it has been found beneficial in New Zealand to feed with ½lb. oats per day, and the results were excellent. It requires a day or two to accustom them to this diet, but afterwards they readily feed on it.

ROSEWORTHY AGRICULTURAL COLLEGE.

Harvest Report, 1913-14.

By Arthur J. Perkins, Principal Roseworthy Agricultural College.

THE WEATHER.

Since I find it my duty to report on the worst harvest I have ever had occasion to handle, and I am given to understand the worst season experienced by the district since the days of its first settlement, it behoves us to scrutinize rather closely the weather conditions mainly responsible for the thwarting of our well-laid plans. By way of preliminary statement I submit below in Table I., month by month, the rainfall registered at the College in 1913, comparatively with the means of the preceding 30 years (1883-1912).

Table I.—*Showing the* 1913 *Rainfall at the Roseworthy Agricultural College comparatively with the Means of the preceding* 30 *Years* (1883-1912).

Months.	1913.	Means of Preceding 29 Years	Months.	1913.	Means of Preceding 29 Years.
	Inches.	Inches.		Inches.	Inches.
January	0·11	0·86	August	1·64	2·09
February	1·94	0·50	September	2·55	1·79
March	1·63	0·88	October	3·89	1·60
April	0·31	1·74	November	1·21	1·04
May	0·31	1·80	December	1·16	0·78
June	0·22	2·65			
July	0·69	1·91	Total	15·66	17·64

Thus, then, 1913 closed with a total rainfall 2in. below the normal mean for the year; and with this total we, as farmers, cannot very well quarrel; but readily admit that 15·66in. of rain, reasonably distributed over the year, offer good solid foundations for heavy cereal crops. It is, therefore, in a careful analysis of the distribution of the yearly rainfall that we shall have to seek for the factors that led to the very low yields that we shall have to put on record.

"Useful" Rain.

In earlier reports I have called "useful" rain, from the point of view of cereal crops in this district, all rain falling between the 1st of April and the 30th of November. The mean "useful" rain for the 30 years extending between 1883 and 1913 is represented on the College Farm by 14·62in.; in 1913, however, it was reduced to 10·82in., i.e., about 4in. below the normal mean. This comparative low "useful" rainfall of 1913 was not as low as that of both 1902 (7·03in.) and 1911 (9·46in.), the two worst years in our 30 years' records; and yet both these years were agriculturally superior in their results to 1913. And it is only in the actual distribution of the "useful" rainfall over the season that we may gain some insight into the causes that have led to the practical failure of cereal crops.

DISTRIBUTION OF "USEFUL" RAINFALL.

Where annual crops are concerned the distribution of rain falling over their period of active growth is of greater importance than the yearly total, or even than that of what we have called "useful" rain. Following the precedent of previous years, I have summarised below in Table II. the distribution of "useful" rain in 1913, comparatively with that of the means of the preceding 30 years.

TABLE II.—*Showing Distribution of "Useful" Rain in* 1913 *comparatively with the Mean Distribution of the previous* 30 *years.*

	1913. Inches.		Means of Previous 30 Years. (1883-1912) Inches.
Seeding rains (April-May)	0·62	..	3·54
Winter rains (June-July)	0·91	..	4·56
Spring rains (August-October)	8·08	..	5·48
Early summer rain (November)	1·21	..	1·04
"Useful" rain (April-November)	10·82	..	14·62

The chief characteristic of 1913, therefore, is from the point of view of cereals in this district, almost complete absence of seeding and winter rains, and copious spring rains. In order to show how anomalous was the 1913 distribution, I append below in Table III. the distribution of useful rain in all years on our records in which the yearly total was below 15in.

TABLE III.—*Showing Distribution of "Useful" Rain in all Years between* 1883 *and* 1914 *in which the Yearly Total was below* 15*in.*

	1885. In.	1888 In.	1891. In.	1895. In.	1896 In.	1897. In.
Seeding rains	2·84	2·45	1·06	4·18	4·50	2·61
Winter rains	3·83	5·14	3·67	4·39	4·38	3·64
Spring rains	3·93	2·99	5·49	3·19	2·35	4·26
Early summer rains	0·11	0·20	1·28	0·15	0·38	0·47

	1899. In.	1902. In.	1904. In.	1911. In.	1912. In.	1913. In.
Seeding rains	2·43	0·28	2·70	2·12	1·10	0·62
Winter rains	2·89	3·55	4·20	3·89	3·55	0·91
Spring rains	3·89	2·92	3·83	3·41	6·56	8·08
Early summer rains	1·44	0·28	0·87	0·04	1·84	1·21

It will be noted, therefore, that if we compare it with our years of lowest rainfall 1913 stands quite alone in the almost complete absence of seeding and winter rains; the shortage of seeding rains in 1891, 1902, and 1912 were in a measure made good by fairly satisfactory winter rains, which was not the case in 1913.

Seeding Rains.

Seeding rains (April-May) may be taken to have been practically nil in 1913; 62 points of rain scattered over nine days are not sufficient at this time of the year to moisten even the surface layers of the soil. Seeding, therefore, took place under dry conditions of soil, and germination remained dependent on the winter rains.

Winter Rains.

Following on an exceptionally dry autumn, the winter rains (June-July) were on the whole insufficient to bring about the satisfactory germination of seed that had been lying in the ground for two or three months. The 91 points of winter rain were distributed over 10 rainy days; the highest aggregate, and, indeed, the only one that can have had any influence on the germination of seed, reached us between July 16th and 20th, when we were vouchsafed 61 points of rain in four days. The net result of these unfavorable seeding and winter conditions was that seed that had been sown in April and May did not show above ground until the month of August. It goes without saying that in these circumstances germination could not but be unsatisfactory and patchy; and the crops eventually very thin and weedy.

There is another important feature connected with late germination which at all times inhibits anything like even mere average yields of corn; and that is the shortening of the growing period of the crops which it usually implies. Thus, in ordinary circumstances, wheats like King's White take about 180 days, or six months, in this district to complete their normal growth; *i.e.*, there elapses between germination and ripeness a period of 180 days, and grain germinating on the 1st of June would in normal circumstances be ripe about the 27th of November. Now the ripening off of the wheat crop is not at all dependent on the date of its germination; but rather it is a direct factor of climatic conditions obtaining in the early summer. And however late it may have germinated, the wheat crop will ripen off so soon as hot and dry weather conditions begin to set in. Now, with crops germinating, say, on August the 1st, there will only be 122 days of growth to the 30th of November, a time when they generally begin to ripen off. And experience is there to show that whenever the growth and ripening off of a crop is hurried over a relatively short period of time, the resulting grain yields are invariably low and of inferior quality.

SPRING RAINS.

With August a change for the better began to set in; although the rainfall for this month—1·64in.—still continued below the normal mean. September, and particularly October, however, proved to be exceptionally wet months, and notwithstanding a late germination, our general harvest prospects took on a more rosy outlook. Unfortunately, we were to experience the disadvantages, as well as the advantages, of a quite exceptional spring. The heavy spring rains, coupled with seasonably warm growing weather, led to somewhat weak sappy growth in the cereals that had germinated too late to have become hardened by winter low temperatures; and in this condition they were more or less helpless when suddenly beset by fierce November heat. The crops practically withered away at sight; nor was this all. The damp spring weather brought upon us such an attack of red rust as had not been seen for over 20 years, in this district at all events. If there was one thing this visitation did well, it was to settle once and for all the credentials of many a so-called rust-resistant variety. In the long run there were but few varieties on the College Farm that did not suffer more or less severely from the attacks of the disease. I do not propose going into details on this subject in this report, as I anticipate dealing with the subject of rust resistance in the light of 1913 experience in a later report. It will suffice for the present if I state that crops that had at one time looked quite promising, shrivelled away before the combined attacks of red rust and fierce heat, and resulted in the end in yields that were quite deplorable. As to the character of the sample, it may perhaps be left to the imagination; as a clue thereto I might add that we were favored with the unusual experience at harvest time of seeing bags of wheat weighing lighter than bags of barley.

FALLOW RAINS.

In preceding reports I have called "fallow rains" rain reaching land lying out as bare fallow between August 1st of one year and March 31st of the year of seeding. In this connection the "fallow rains" immediately preceding the 1913-14 season were represented by 13in. against a normal mean of 9·54in. (1883-1912). It is often put forward, and apparently with good cause, that one of the chief advantages of the practice of bare fallow before wheat lay in the fact that it led to the storing up in well-tilled land of portion of the rainfall reaching the latter between the dates indicated. We might have expected, therefore, that the unusually heavy fallow rains above indicated would have shown up to particular advantage in a comparatively dry season like 1913-14. We shall have occasion to see that in this instance facts do not bear us out in these expectations; and yet, never in my recollection have our fallows been earlier or more thoroughly tilled than was the case in 1912-13. We must conclude, therefore, that heavy fallow rains and good tillage are more or less impotent for good in the face of an almost total absence of seeding and winter rains

Ensilage Crops.

If there is one type of crop that needs to be heavy, if it is to be at all advantageous, it is an ensilage crop. Unfortunately, under conditions that have already been described, it became abundantly evident quite early in the season that we should have no heavy rank-growing crop of any kind, and consequently no ensilage worth cutting. But with a dairy herd on our hands, to us in this district ensilage is practically indispensable between January and the first appearance of the new season's grass. Our pits, therefore, had to be filled in the best conditions that the season permitted of, and from the sources that appeared the least unpromising. We first turned our attention to some irregularly-grown portion of a wheat crop in the field known as "Daly's." Here we cut out 12·555 acres, which yielded 3 tons 5cwts. 45lbs. of greenstuff to the acre. Next, from a very weedy portion of a wheat crop in "Flett's" we secured only 1 ton 9cwts. 109lbs. to the acre from 7·256 acres.

On August the 1st we had sown in Dahlitz 41·8 acres to Early Dun peas at the rate of 75lbs. to the acre. The plants did not show regularly above the ground until the middle of August. This field had carried wheat in the preceding season. The general growth of the crop was not very satisfactory; but since we were in urgent need of greenstuff for ensilage purposes, and had already proved the great value of peas in this direction in the preceding season, we decided to cut out this field for ensilage. This was done between November 8th and 19th, which gave to the peas barely three months of growth. The crop was thin and not at all rankly grown, hence the yield of greenstuff was very much below our usual experience. The yield to the acre ultimately proved to be 1 ton 10cwts. 76lbs.

Thus, in sum total we secured 115 tons 14cwts. 24lbs. of greenstuff from 61·511 acres, representing a general average of 1 ton 17cwts. 70lbs.; and the complete filling up of the ensilage pits was left to summer-grown sorghum. How disappointingly low is such a yield will be gathered by a reference to Table IV., in which is indicated the 1913 yield comparatively with those of the previous eight years.

Table IV.—*Showing Average Yields of Ensilage Crops*, 1905-1913.

Season.	Rainfall.		Yields per Acre.		
	"Useful." Inches.	Total. Inches.	Tons	cwts.	lbs.
1905	14·23	16·71	8	10	0
1906	16·30	19·72	11	18	0
1907	13·81	15·06	5	7	34
1908	15·53	17·74	7	12	44
1909	21·15	23·05	10	0	3
1910	16·79	23·87	8	15	32
1911	9·46	13·69	4	19	47
1912	13·05	14·97	3	9	45
1913	10·82	15·66	1	17	70
Average yield of nine years			6	18	93

HAY CROPS.

If we had difficulty in finding material to fill our ensilage pits, even greater difficulties awaited us when we were set the problem of making a provision of hay adequate to our normal requirements. As a rule, in order to find myself in a position to meet the emergencies of a bad season, I like to see at least 300 tons of hay stacked away for future use. In 1912, with over 432 tons of hay on hand, I thought that I had made ample provision for the worst possible of seasons. Indeed, I confidently anticipated that we should have been able to meet the new season with fully 100 tons of old hay on hand, instead of which there was not a sheaf of hay over when hay-carting was first put in hand. And where the hay for the new year was to come from, unless the whole of our crops were cut down for this purpose, it was difficult to see. Eventually I decided to cut about 200 tons, and to trust to sorghum hay for later requirements. Unfortunately it has to be stated now that the sorghum crops of the season were exceedingly poor, and we are certainly not in a position to meet another season like 1913.

As we certainly had no crops that could be called good hay crops, I decided to cut out those that appeared least promising for wheat; and as in the course of time red rust spread most insidiously, I adhered rigorously to the plan originally determined upon. And with the miserable yields that ultimately awaited us, it is a matter of regret that, apart from seed and feeding requirements, every field on the farm was not cut out for hay.

The crops cut for hay are referred to below under each field from which they proceeded.

FIELD NO. 9.

I summarise the past history of this field below:—1898, bare fallow; 1899, wheat; 1900-03, pasture; 1904, sorghum and millet; 1905, barley; 1906-09, pasture; 1910, maize; 1911, wheat and oats; 1912, barley; and 1913, peas and wheat.

It will be seen, therefore, that the 1913 crop was the fourth successive crop carried by this field in four years. The season cannot be said to have been too propitious for a crop of this kind; nevertheless, as we shall have occasion to see, it yielded quite as well as other hay crops sown on bare fallow.

The barley stubble of 1912 was broken up in June, 1913, and on the 26th of the same month was drilled over with 100lbs. of Early Dun peas and 1cwt. of superphosphate to the acre. Immediately afterwards 100lbs. of King's Early were broadcasted over the field. The field was subsequently rolled and harrowed. I may state here that the quantity of wheat broadcasted was exactly double what I intended. As matters turned out, however, germination was so unsatisfactory in this field that the heavier seeding gave rise to more satisfactory results than would otherwise have been the case.

This crop was originally intended for ensilage purposes. Although thin, it was so clean and well grown that I decided eventually to cut it for hay. It yielded 15cwts. 15lbs. per acre of very good hay.

FIELD NO. 6D.

The past history of this field is given below in summarised form :—1895, oats ; 1896, peas ; 1897, wheat ; 1898, pasture ; 1899, bare fallow ; 1900, wheat ; 1901, pasture ; 1902, bare fallow ; 1903, wheat ; 1904-05, pasture ; 1906, bare fallow ; 1907, wheat ; 1908-10, pasture ; 1911, bare fallow ; 1912, wheat, oats, and beans ; and 1913, wheat.

Here again, then, we have a wheat crop following another wheat crop ; and it must be stated that the yield, although low, compares favorably with that of other hay crops raised on fallow land. The stubbles of the preceding season were broken up with a disc plough in February, 1913, the field was rolled and cultivated in March, and between March 29th and April 1st drilled over with superphosphate at the rate of 275lbs. to the acre. Between April 30th and May 1st King's White wheat was broadcasted over this field at the rate of 155lbs. to the acre. The seed was cultivated in, and the field subsequently harrowed. On May 5th lucerne seed was broadcasted over the field at the rate of 12lbs. to the acre, and rolled in on the day following. The crop was always intended for hay. Like all our crops, however, it turned out very thin and light, the yield being represented by 11cwts. 74lbs. per acre. It may be stated that the lucerne made very good growth and may be depended upon to give very good pasture for the next three years.

FIELD NO. 7B.

The past history of this field may be summarised as follows :—1897, pasture ; 1898, wheat ; 1899, pasture ; 1900, oats ; 1901, pasture ; 1902, oats ; 1903, pasture ; 1904, bare fallow ; 1905, wheat and oats ; 1906, crimson clover ; 1907, pasture ; 1908, maize and sorghum ; 1909, barley ; 1910, maize and sorghum ; 1911, wheat and oats ; 1912, peas ; 1913, wheat and oats.

This field has been continuously under crop ever since 1907, *i.e.*, for a period of seven years ; and in the course of 17 years it has been treated as bare fallow only on one occasion, and that in 1904. The pea stubbles, after having been grazed over with sheep, were broken up with a disc plough in February, 1913, and subsequently rolled and cultivated. Towards the end of March the field was drilled over with superphosphate at the rate of 255lbs. to the acre, and on April 29th it was broadcasted with a mixture of 60lbs. of Calcutta oats and 90lbs. of White Tuscan wheat to the acre. From May 3rd to 5th the field was harrowed, and subsequently broadcasted with 12lbs. of lucerne seed to the acre, which was rolled in. The early growth of this crop was exceedingly poor ; it recovered somewhat, however, towards the end of the season. This field yielded eventually 17cwts. 90lbs. to the acre of very fair hay.

FIELD No. 6C.

The past history of this field may be summarised as follows :—1895, oats ; 1896, peas ; 1897, wheat ; 1898, pasture ; 1899, bare fallow ; 1900, wheat ; 1901, pasture ; 1902, bare fallow ; 1903, wheat ; 1904-05, pasture ; 1906, bare fallow ; 1907, barley ; 1908, pasture ; 1909, bare fallow ; 1910, wheat, oats, and rye ; 1911, kale and rape ; 1912, bare fallow ; 1913, oats.

This field, which was treated as bare fallow in 1912, was drilled over with superphosphate at the rate of 2cwts. to the acre in March, 1913. On April 27th and 28th Calcutta oats were broadcasted over it at the rate of 80lbs. to the acre ; the field was subsequently cultivated, harrowed, and rolled. Lucerne seed was broadcasted over at the rate of 12lbs. to the acre between May 8th and 10th, and subsequently rolled in.

The oats did not show above ground until August, and the early growth of the crop was exceedingly poor ; so much so that at one time I contemplated using the field for grazing purposes. It improved somewhat later on, and eventually it was cut for hay rather on the ripe side. The yield proved to be 15cwts. 48lbs. to the acre ; no better, it will be noted, than the yields of the other fields already quoted which had not been preceded by bare fallow.

" FLETT'S.

This is a field about 175 acres in area, about 33 acres of the worst grown crops of which were cut out for hay. The balance of the field carried special wheat and barley crops, and the previous history of the field will be indicated under a later heading. It will be sufficient to state here that the field had carried wheat, barley, and rye in 1911, and had been treated as bare fallow in 1912.

The hay yield in this field was 1 ton 0cwt. 89lbs. to the acre ; the heaviest hay yield we are able to boast of in 1913.

" DALY'S."

This field, too, about 150 acres in area, was under various varieties of wheat, close on 92 acres of which were cut out for hay, chiefly because of the progress of red rust. This field came into our hands in 1912, and was fallowed by us for the first time in July of the same year. The portion of the field cut out for hay yielded 16cwts. 4lbs. to the acre.

" EBSARY'S B."

Of this field, about 73 acres in area, 38 odd acres were cut out for hay, the balance of the field was left under various varieties of wheat. It will be sufficient to state here that whilst this field carried wheat and barley in 1911, it was treated as bare fallow in 1912. The hay yield turned out to be 17cwts. 90lbs. to the acre.

GENERAL AVERAGE HAY YIELD IN 1913.

Eventually we took 207 tons 7cwts. 111lbs. of hay from 258·185 acres; this works out to a general hay average for the year of 16cwts. 7lbs. to the acre, by far the lowest average that we have ever had to place on our records. I have summarised below the recorded averages of preceding years.

TABLE V.—*Showing average Hay Yields on the College Farm*, 1904-13.

Season.	Rainfall. "Useful." Inches.	Rainfall. Total. Inches.	Area. Acres.	Average Yield per Acre. Tons	cwts.	lbs.
1904	11·60	14·70	93·0	2	11	22
1905	14·23	16·71	60·0	3	5	67
1906	16·30	19·72	93·0	2	11	90
1907	13·81	15·06	51·0	1	15	108
1908	15·53	17·74	112·8	2	7	5
1909	21·15	23·05	145·3	2	15	68
1910	16·79	23·87	94·9	2	7	31
1911	9·46	13·69	200·1	1	8	6
1912	13·05	14·97	248·4	1	14	90
1913	10·82	15·66	258·2	0	16	7
General average of 10 years				2	3	38

BARLEY CROPS.

In 1913 we had 31 acres under barley sown on bare fallow, and 60 acres of barley sown on the stubbles of a 1912 wheat crop; and, as will be seen in the sequel, this is the first season in our experience in which barley did not do tolerably well as a second crop.

FIELD EBSARY'S A.

The past history of this field may be summarised as follows:—1904, wheat; 1905, pasture; 1906, bare fallow; 1907, barley; 1908-10, pasture; 1911, bare fallow; 1912, wheat, barley, and rye; 1913, barley.

The 1912 stubbles were broken up in February and March, 1913, with a stump-jump plough, and the field was subsequently rolled and cultivated. On May 6th and 7th an area of 20·65 acres was sown to Roseworthy Oregon barley at the rate of 70lbs. of seed to the acre and 2cwts. of superphosphate. This plot yielded 8bush. 8lbs. to the acre.

Immediately after the preceding plot, 33·47 acres were sown to Short Head barley of the 6th selection, at the same rate of seeding and manure. The yield of this plot was 6bush. 39lbs. to the acre.

These results, of course, are very unsatisfactory. It can be said that the season was wholly against a second crop of the sort; indeed, the barley can be said never to have got a start until October, when it was too late to make up for lost time.

FIELD "FLETT'S."

This large field was mostly under various varieties of wheat, and its past history will be indicated when dealing with the latter. It will be sufficient to state here that the field was under wheat in 1911, and treated as bare fallow in 1912. About 31 acres were sown to various varieties of barley in the first week of May. Full details concerning the latter are shown below in Table VI.

TABLE VI.—*Showing Details concerning Six-Row Barleys sown in "Flett's."*

Variety.	Selection.	Date Sown.	Germinated.	Area. Acres.	Yield per Acre. Bush.	lbs.
Square Head	8th	May 8	July 28	2·688	20	15
Roseworthy Oregon	5th	May 7–8	?	9·442	27	38
Roseworthy Oregon	6th	May 8	July 28	5·571	22	8
Short Head	6th	May 7	?	7·711	18	18
Short Head	7th	May 7	July 29	5·545	19	28
Albert	1st	May 1	July 29	0·107	16	32
Total				31·064	22	14

In ordinary seasons it has been our general experience that barley crops sown after bare fallow make far too rank growth for heavy grain yields. In a season such as this, however, the results have proved satisfactory, and it may be pointed out that had the College Farm been one worked purely for monetary profit, barley crops would have proved far more profitable in a season such as this than wheat crops.

GENERAL AVERAGE BARLEY YIELDS IN 1913.

Including the plots of the Permanent Experiment Field, we reaped 1,128bush. 30lbs. of barley from 91·093 acres, which represents an average yield for the year of 12bush. 19lbs. to the acre, by far the lowest average yield on our records. I append below in Table VII. a statement showing the average barley yields on the College Farm since 1904.

TABLE VII.—*Showing General Average Barley Yields on College Farm,* 1904-13.

Season.	Rainfall.		Area.	Yields per Acre.	
	"Useful." Inches.	Total. Inches.	Acres.	Bush.	lbs.
1904	11·00	14·70	27·86	38	33
1905	14·23	16·71	65·73	25	4
1906	16·30	19·72	51·00	40	38
1907	13·81	15·05	79·30	31	21
1908	15·53	17·74	94·83	43	49
1909	21·15	23·05	75·27	35	0
1910	16·79	23·87	113·42	37	9
1911	9·46	13·69	76·09	39	31
1912	13·05	14·97	123·82	22	21
1913	10·82	15·66	91.09	12	19
Mean of 10 years				32	32

OAT CROPS.

Our chief oat crop was sown in Field No. 6c, and, as has already been stated, was cut for hay. In "Flett's" we had two small plots—0·801 and 0·525 acres respectively—of Scotch Grey oats, the yields of which were 28bush.

26lbs. and 25bush. 34lbs. to the acre. On the other hand, the two-acre plot of Calcutta oats in the Permanent Experiment Field, grown in continuous rotation, yielded only 1bush. 21lbs. These few data represent a yield of 11bush. 36lbs. from 3·326 acres.

Below, in Table VIII., I have indicated the yields of preceding years of which we have any record.

Table VIII.—*Showing Average Yields of Oats on the College Farm*, 1905-13.

Season.	Rainfall.		Area Sown.	Yield per Acre.	
	"Useful." Inches.	Total. Inches	Acres.	Bush.	lbs.
1905	14·23	16·71	20·00	43	10
1906	16·30	19·72	33·50	41	18
1907	13·81	15·05	20·00	Complete failure from feeding off with sheep.	
1908	15·53	17·74	20·00	22	28
1909	21·15	23·05	23·52	43	19
1910	16·79	23·87	24·60	28	15
1911	9·46	13·69	22·82	22	8
1912	13·05	14·97	52·00	10	4
1913	10·82	15·66	3·33	11	36
Average of eight years (omitting 1907)				27	39

RYE CROPS.

As has been the case since 1909, we had a few acres under four varieties of ryes originally imported from France. The ryes were sown in "Flett's." Details concerning these crops are shown below in Table IX.

Table IX.—*Showing Details of Rye Crops sown in "Flett's" in* 1913.

Variety.	Date Sown.	Germinated.	Area Sown. Acres.	Yield per Acre. Bush.	lbs.
Giant Winter	May 1	July 28	0·418	12	0
March	May 1	July 28	0·418	11	49
Multicaule	April 30	July 28	0·418	11	42
Schlanstedt	May 1	July 28	0·418	7	0
Average yield of rye in 1913				10	36

The yields of preceding seasons are shown below in Table X.

Table X.—*Showing Yields of Ryes on College Farm*, 1909-13.

Season.	March Rye.		Giant Winter Rye.		Multicaule Rye.		Schlanstedt Rye.		Means.	
	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.
1909	7	46	11	34	8	44	4	3	8	15
1910	16	4	12	36	12	40	15	14	14	9
1911	20	9	9	45	11	24	9	48	12	43
1912	15	6	11	4	11	22	10	13	12	0
1913	11	49	12	0	11	42	7	0	10	36
Means	14	12	11	24	11	12	9	16	11	32

(*To be continued.*)

DEPARTMENT OF AGRICULTURE.—FARMERS' EXPERIMENTS.

TESTS OF MANURES.

Conducted by Mr. F. Coleman, Saddleworth.

During the last nine years Mr. Coleman has very carefully conducted tests of the effect of different manures on his farm. The results, from year to year, prove interesting, and the value of the work increases with the extension of the period of test. The plots, 16 in number, are each one half-acre in extent, and eight of them are cropped each year, the other eight being carefully fallowed, so that the land carries wheat after fallow each alternate year.

Mr. Coleman reports that "though sown in May, the seed did not germinate till July. The late start and subsequent rapid growth in October rendered the soft, sappy plant subject to red rust, which affected it a good deal, and no doubt rendered it less able to stand the hot days at the end of November, the wheat drying rather than ripening. Screenings were exceptionally large, each half-acre averaging over 2bush., compared with 20lbs. each last year. Plot No. 5 yielded nearly half of the total as screenings, and was a very poor sample."

Plot No. 7, which from 1905 to 1911 inclusive, had received ½cwt. sulphate of potash and ½cwt. nitrate of soda per acre, was in 1912 and 1913 dressed with 2cwts. of superphosphate, which dressing will in future years be continued. It is well to point out that as the plots are fallowed each alternate year, the 1912 and 1913 dressings constituted in each year the first application of phosphates for the period during which these tests have been conducted.

Manurial Tests, Saddleworth.

Sown May 27th, 1913. Harvested December 16th, 1913. Rainfall, May 27th, 1913, to December 16th, 1913, 10·38in.

Table 1.

	PLOT 1.	PLOT 2.	PLOT 3.	PLOT 4.	PLOT 5.	PLOT 6.	PLOT 7.	PLOT 8.
	1cwt. Mineral Super. per Acre.	1cwt. Mineral Super., 5cwts. Lime per Acre.	1cwt. Mineral Super., ½cwt. Sulph. of Potash, ½cwt. Nitrate of Soda per Acre.	1cwt. Bone Super. per Acre.	No Manure.	1cwt. Mineral Super. ½cwt. Sulph. of Potash per Acre.	½cwt. Sulph. of Potash and ½cwt. Nitrate of Soda —7 Years. 2cwt. Mineral Super. 2 Years	1cwt. Mineral Super., ½cwt. Nitrate of Soda per Acre.
	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
1905........	31 0	29 22	33 48	34 36	29 50	35 6	30 38	33 10
1906........	32 20	34 10	32 22	33 56	23 40	33 34	24 42	36 8
1907........	35 42	38 2	39 8	36 22	24 52	35 32	25 16	35 50
1908........	17 38	19 28	20 52	17 34	7 36	19 36	8 50	18 52
1909........	31 42	32 54	35 6	30 40	24 32	29 34	23 18	33 34
1910........	21 4	22 26	25 20	26 24	15 12	28 44	15 28	29 38
1911........	21 54	24 0	24 40	24 44	15 30	24 6	15 34	20 40
1912	23 34	27 22	27 50	28 56	12 58	26 14	29 36	23 58
1913........	26 22	26 36	25 14	24 36	4 56	22 44	21 10	20 34
Averages 9 years ..	26 48	28 15	29 22	28 38	17 41	28 21	25 23 2 years only.	28 3

Table 2.—*Increased Yield over Unmanured Plot*, 1913.

Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 5.	Plot 6.	Plot 7.	Plot 8.
Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.
21 26	21 40	20 18	19 40	—	17 48	16 14	15 38

Table 3.—*Value of Increased Yield over Unmanured Plot*, 1913.

	Plot 1.	Plot 2.	Plot 3	Plot 4.	Plot 6.	Plot 7.	Plot 8.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
Value of increase	3 13 3	3 14 0	3 9 4	3 7 2	3 0 10	2 15 6	2 13 5
Value of Manure...	0 4 0	0 9 10	0 18 0	0 5 6	0 11 0	0 8 0	0 11 0
Net value of incrse.	£3 9 3	£3 4 2	£2 11 4	£3 1 8	£2 9 10	£2 7 6	£2 2 5

Table 4.

	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 6.	Plot 7.*	Plot 8.
	Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.	Bus. lbs.
Increased yield over unmanured plot for 9 years............	82 10	95 14	105 14	98 42	96 4	32 52	93 18
	£ *s*. *d*.	£ *s*. *d*.	£ *s*. *d*.	£ *s*. *d*.	£ *s*. *d*.	£ *s*. *d*.	£ *s*. *d*.
Value at 3s. 5d. per bushel	14 0 9	16 5 5	17 19 7	16 17 3	16 8 3	5 12 4	15 18 9
Value of manure	1 16 0	4 8 6	8 2 0	2 9 6	4 19 0	0 16 0	4 19 0
Net value of increase	12 4 9	11 16 11	9 17 7	14 7 9	11 9 3	4 16 4	10 19 9
Average annual value of increase	1 7 2⅓	1 6 4	1 1 11⅓	1 11 11⅔	1 5 5⅔	2 8 2	1 4 5

* Plot 7 for two years only.

TESTS OF VARIETIES OF WHEAT FOR GRAIN AND HAY AT ALDINGA.

These tests were conducted by Mr. Pengilly on his farm.

The land had been carefully and thoroughly fallowed, and the crop was dressed with 2cwts. of superphosphate per acre. Each plot was 2 acres in extent, and one-half of each plot was cut for hay. The following are the results for 1913 :—

Table 5.

Variety.	Hay per Acre.				Grain per Acre.	
	Tons	cwts.	qrs.	lbs.	Bush.	lbs.
Gluyas..................................	2	15	1	22	28	37
Yandilla King	2	17	1	18	24	44
Dart's Imperial	3	4	2	7	23	52
Cumberland	2	6	3	26	23	52
American No. 8............................	2	18	1	23	22	35
Triumph	2	6	0	10	20	34
Crossbred No. 53	3	6	0	11	18	24
White Tuscan	3	6	3	0	17	5
Average yield	2	17	2	25	22	28

CARRYING CAPACITY OF DIFFERENT FORAGE CROPS.

FEEDING-OFF TESTS.

Each plot 2 acres in extent, and manured with 1¾cwts. superphosphate per acre.

Table 6.

Natural Grass Plot.—63 sheep 7 days ; 157 sheep, 14 days ; 157 sheep, 3 days ; equivalent to 10·22 sheep per acre for five months in spring and early summer.

Italian Rye Grass.—100 sheep, 14 days; 157 sheep, 14 days; 157 sheep, 3 days; 157 sheep, 3 days; equivalent to 14·92 sheep per acre for five months in spring and early summer.

Calcutta Oats.—110 sheep, 14 days; 157 sheep, 14 days; 157 sheep, 5 days; equivalent to 14·85 sheep per acre for five months in spring and early summer.

Peas—157 sheep, 18 days; 24 sheep, 11 days; equivalent to 10·15 sheep per acre for five months in spring and early summer.

Barley.—100 sheep, 14 days, 157 sheep, 14 days; 157 sheep, 5 days; equivalent to 14·4 sheep per acre for five months in spring and early summer.

Mustard and Rape.—51 sheep, 9 days; 70 sheep, 7 days; 100 sheep, 14 days; 157 sheep, 7 days; 157 sheep, 3 days; 100 sheep, 2 days; equivalent to 13·53 sheep per acre for five months in spring and early summer.

The plots are each enclosed with permanent fences. The natural grass plot is top-dressed each year with the same quantity of manure per acre as is applied to the cultivated plots.

These cultivated plots are rotated from year to year, manured each year, and grazed.

The quantity of seed used per acre for these respective forages was as follows:—Italian rye grass, 30lbs. per acre; Cape barley, 1½bush. per acre; oats, Calcutta, 1½bush. per acre; peas, 2bush. per acre. Seeds, such as Italian rye grass, rape, and white mustard, not being hitherto in much demand, are quoted by seedsmen at special prices, but if the extension of the cultivation of these forages became general, it would no doubt follow that the seed could be obtained here much cheaper, as obtains elsewhere. The prices might be expected to rule somewhat as follows:—Rape, 4½d. per pound; white mustard, 4d. per pound; Italian rye grass, 4d. per pound.

It will be noted that the grazing capacity would be considerably lower if a certain smaller number of sheep were turned on to the plots and kept there for anything like the period indicated, as the land would become sheep foul, and much of the feed would be trodden down. It is of great advantage in favor of higher results that the sheep are turned into these two-acre plots as each grazing becomes ready, and taken out immediately that it is fed, in order that the forage may grow again.

Table 7.—Grazing Equivalent of the Different Forages in Number of Sheep per Acre for Five Months in Spring for Three Years, as follows:—

	1911.	1912.	1913.
Grass and herbage uncultivated, but dressed with artificial manures	9·33	6·55	10·22
Italian rye grass	8·80	8·16	14·92
Oats	9·40	7·36	14·85
Peas	5·20	8·11	10·15
Barley	10·46	8·53	14·40
Mustard and rape	8·80	8·76	13·53

POULTRY NOTES.

By D. F. **Laurie**, Government Poultry Expert and Lecturer.

Early Greenfood.

March is a good time to prepare the ground for early crops of greenfood. The first to be sown should be berseem, the Alexandria or Egyptian clover. This valuable fodder has given remarkable results at Roseworthy College, and Professor Perkins recommends sowing in March, while the ground is warm, and flooding till the wet weather commences. Several breeders have grown berseem and find it much liked by poultry. Sow seed at the rate of 30lbs. to an acre. Following on berseem one may sow seeds of the three kails for transplanting later on, also silver beet. Lucerne may be sown in April, also barley, rye, and oats for greenfood. Small areas of well-prepared liberally manured soil will, if well watered, supply more and better greenfood than much larger areas not so well attended to.

The Breeding Stock.

Up-to-date market breeders already report successful hatchings of chickens. No time should be lost in overhauling the breeding stock and selecting for breeding—(1) Those hens still in full feather and which have not ceased laying. (2) Those which have moulted and are likely to lay soon. Leghorns and Wyandottes may be generally relied upon for successful autumn hatchings, and many good lots of Rocks and Orpingtons have been seen.

Eggs.

The warm weather may last six or more weeks, and unless eggs for market are infertile there are the usual risks. Farmers, especially, can do much to improve the conditions of the Adelaide egg market by adopting modern methods and keeping all male birds away from the flocks of layers. The price is steadily rising, and of all times one cannot now afford to risk eggs. We have recently seen the mammoth *Australia*—the great war ship of 19,000 tons—at anchor where the old *Buffalo*, the 600-ton warship, lay when this State was proclaimed. Just as much difference as is between the ancient and the modern ship is also between the old style (and one might also say ancient eggs) and the new methods demanding fresh infertile eggs. All producers should progress and take pride in the fine quality of their produce.

CLEAR OFF USELESS STOCK.

Get rid of all useless and inferior stock; it does not pay to keep. If you have no good stock, lose no time in obtaining some. There is plenty of reliable stock, and good breeders are legion. Do not buy the cheap and nasty—for good reliable stock you must pay a fair price.

INCUBATION.

It is essential to success that successive batches should be hatched within a given time. You cannot afford to depend upon hens; so many rarely go broody until the hatching season is drawing to a close. Modern incubators are reliable and easily managed. Lose no time in ordering one. Later on the makers will be rushed with orders and you may have to wait. Buy honest machines from a reputable maker; beware of so-called "gift" machines. No one can afford to sell a good incubator for the price of a jam box.

POULTRY TICK.

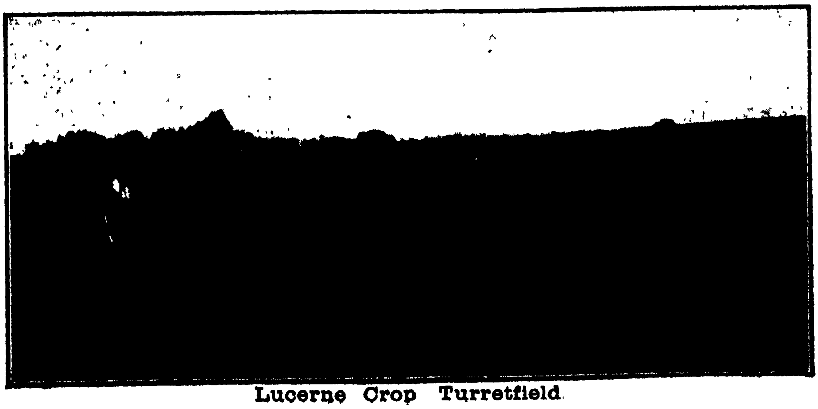
Poultry owners are not doing their best to eradicate this terrible pest. If you do not know how to deal with them write for a bulletin, which can be had gratis.

ANNUAL REPORT.

Last year's annual report of the Poultry Expert is now available, and can be had gratis on application. There is much in this report that will interest you.

TO BREED LAYERS.

To properly breed layers you must single test your hens before breeding from them. You can obtain free a bulletin from the Poultry Expert giving full particulars of how to proceed. Plans of the yards and houses are included.



Lucerne Crop Turretfield

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, to terminate March 31st, 1914.]

Competitor.	Eggs Laid for Month ended Feb. 28th.	Total Eggs Laid from April 1st, 1913, to February 28th, 1914.
SECTION I.—LIGHT BREEDS.		
White Leghorns.		
Hurford, E. W., Grangeville	60	1,114
Hammill, H., Kogarah, New South Wales	77	1,189
Carter, A. A., Keswick	58	921
Robins, G. W., Hawthorn, Victoria	80	1,179
Dunn, L. F., Keswick	89	1,160
McKenzie, H., Northcote, Victoria	63	1,214
Cowan Bros., Burwood, New South Wales	77	1,122
Robbins, G. W., Hawthorn, Victoria	81	1,062
Pettigrove, T. A., Northcote, Victoria	65	1,129
Eckermann, W. P., Eudunda	37	883
Robertson, F., New Hindmarsh	84	1,023
Pettigrove, T. A., Northcote, Victoria	65	1,026
Cant, E. V., Medindie	34	932
Schäfer, N. H., Strathalbyn	58	1,122
Redfern Poultry Farm, Caulfield, Victoria	73	1,119
Chapman, G. H., Port Pirie	43	757
Lewis, F. M., Caulfield, Victoria	85	1,140
Redfern Poultry Farm, Caulfield, Victoria	91	1,244
Hagel, W. C., Mallala	91	1,171
Hocking, E. D., Kadina	84	999
Sargenfri Poultry Yards, East Payneham	77	1,076
Joass, W. A., Rothbury, New South Wales	79	1,139
Bennett & Furze, Wright Street, Adelaide	58	1,039
Jury, W. H., Torrensville	82	1,120
Olive Poultry Farm, Freeling	75	1,156
Kelly, Mrs. W. J. L., Quorn	44	692
Indra Poultry Farm, Freeling	54	1,275
Electricum Poultry Yards, Glenelg	66	995
Sargenfri Poultry Yards, East Payneham	63	1,217
Moritz Bros., Kalangadoo	104	1,297
Brown, S., Gembrook South, Victoria	75	1,075
Matthews, H. G., Fullerton	76	1,137
Harris, J. G., Black Forest	46	1,094
Tockington Park Poultry Farm, Grange	50	1,094
Bradley, J. E., Newport, Victoria	71	1,252
Miller, B., Parkside	59	960
McKenzie, E., Northcote, Victoria	92	1,373
Tockington Park Poultry Farm, Grange	92	1,244
Provis, W., & Son, Tumby Bay	75	1,211
Hillcrest Poultry Farm, Brighton, Victoria	64	1,127

EGG-LAYING COMPETITION—*Continued.*

SECTION I.—LIGHT BREEDS—*Continued.*

WHITE LEGHORNS—*Continued.*

Competitor.	Eggs Laid for Month ended Feb. 28th.	Total Eggs Laid from April 1st, 1913, to February 28th, 1914.
Beadnall Bros., Gawler	28	921
Morgan & Watson, Frankston, Victoria	75	1,246
Gibbs & Pine, Queenstown	40	849
Hillside Poultry Yards, Hamley Bridge	53	893
Hall, A. W., South Oakleigh, Victoria	30	1,072
Dreyer, G. H., Wolfram Street, Broken Hill	71	1,151
South Yan Yean Poultry Farm, Doreen, Victoria	52	1,168
Pope, R. W., Heidelberg, Victoria	64	1,276
Tabuteau, J. O., Black Rock, Melbourne	55	1,028
"Koonoowarra," Enfield	66	1,025
Hagger, J. C., Orroroo	81	1,235
Bertelsmeier, C. B., Clare	84	1,134
South Yan Yean Poultry Farm, Doreen, Victoria	77	1,169
Jelliff, Mrs. T., Beverley, Adelaide	72	1,230
Hughes, J. J., Elsternwick, Victoria	46	1,073
Stewart, J. R., Thirlmere, New South Wales	58	971
Aveling, T. B., Quorn	41	886
"Nunkerowi," Neales Flat	68	921
Prior, D., Moonta Mines	51	935
Leonard, W. J., Port Pirie	56	1,045
Barkla, L. W., Gawler South	70	1,025
Foreman, E., Hindmarsh	63	1,097
Broderick Bros., Gawler	36	864
Tubb, E. C., Frewville	70	981
Harfield, B. L., Pinnaroo	73	948
Foreman, E., Hindmarsh	59	1,004
Tomlinson, W., Westbourne Park	89	1,127
Woodhead, H., Torrensville	78	1,162
Padman, A. H., Hyde Park	92	1,158
Franklin, G., Norwood	57	1,099
Mathias & Weller, Unley	65	931
Messenger, A., Port Adelaide	93	1,212
Albion Poultry Farm, Magill	81	1,092
Dunstan, L. A., Port Pirie	82	1,042
Trenwith, T. H., Kadina	44	855
Purvis, W., Glanville	92	1,230
Rice, J. E., Cottonville	49	1,041
Evans, H. A., Richmond	91	1,084
Miels, C. & H., Littlehampton	89	1,155
Swift, W. G., Northcote, Victoria	91	1,248
Bertelsmeier, C. B., Clare	74	1,115
Brundrett, S., Moonee Ponds	68	1,083
Glenelg River Poultry Farm, Mount Gambier	74	1,045
Padman, A. H., Hyde Park	75	1,057
Purvis, Miss Gracie, Glanville	70	1,070
Braund, J. E. & H. J., Islington	75	1,099
Ontario Poultry Farm, Clarendon	52	815
Brock, A. G., Hamley Bridge	54	946
Russell, E. L., Salisbury	49	1,030
Schwabl, J., Elsternwick, Victoria	51	1,114
Moritz Bros, Kalangadoo	83	1,118
Craig Bros., Hackney	72	1,069
Codling, H., Mitcham Park	23	701

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended Feb. 28th.	Total Eggs Laid from April 1st, 1913, to February 28th, 1914.
SECTION I.—LIGHT BREEDS—*Continued.*		
WHITE LEGHORNS—*Continued.*		
Tidswell, H. J., Clarence Park	55	820
Bennett, E. V., Kalangadoo	71	1,042
Lillywhite, R. G., Malvern	65	993
Harris, A. W., Mallala	79	1,097
Hagger, W. H., Malvern	75	1,097
Winter, W. C., (Nalpa), Strathalbyn	56	667
Whitegate Poultry Farm, Deepdene, Victoria	83	1,060
BROWN LEGHORN.		
Toe, C. E., Brighton, Victoria	67	697
BLACK MINORCA.		
Whitrow, A. J., Knoxville	46	799
SECTION II.—HEAVY BREEDS.		
BLACK ORPINGTONS.		
Neville, A. B., Fullarton	69	926
Thornton, W. J., Kew, Victoria	56	894
Kenway, D., West Pennant Hills, New South Wales	53	1,151
Martin, B. P., Unley Park	57	1,003
Cowan Bros., Burwood, New South Wales	66	1,026
Tockington Park Poultry Farm, Orange	68	920
Pearson, W. S., Kingswood	43	864
Hall, A. W., South Oakleigh, Victoria	31	830
Padman, J. E., Plympton	52	938
Greaves, W. E., Prospect	67	716
Bertelsmeier, C. B., Clare	43	539
Coto, T. W., Myrtle Bank, Victoria	82	1,065
Convent of the Good Shepherd, Oakleigh, Victoria	51	854
BUFF ORPINGTONS.		
Hocart, F. W., Clarence Park	44	758
SILVER WYANDOTTES.		
Dunn, L. F., Keswick	61	930
Western, F. C., Marion	35	771
Kappler Bros., Marion	35	696
WHITE WYANDOTTES.		
Bradley, J. E., Newport, Victoria	73	999
BLACK LANGSHANS.		
Stevens, E. F., Littlehampton	42	863
FAVEROLLES.		
Williams, W. H., Frewville	61	699
DORKINGS.		
Cathcart, J. F., Newburg, Scotland	33	673

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended Feb. 28th.	Total Eggs Laid from April 1st, 1913. to February 28th, 1914.
SECTION III —PRODUCERS.		
Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.		
WHITE LEGHORNS.		
Broster, G., Mallala	74	997
Carling, Mrs R., Kangaroo Flat	111	1,250
Rowe, J., Long Plain	80	1,136
Broster, G., Mallala	63	1,052
Gilbert, F. W., Kangaroo Flat	59	1,117
Campbell J. D., Barabba	67	1,140
Forest Leigh Poultry Farm, Jamestown	57	896
Kerr, R., Longwood	85	1,148
Carling, Mrs . R., Kangaroo Flat	62	1,133
Rowe, J., Long Plains	78	1,088
Gill, R., Marrabel	51	901
Wurst, G. H., Marrabel	73	1,042
Sherrah, E., Long Plain	71	1,002
Rowe, N., Long Plain	75	1,055
Shepherd, R. H., Balaklava	66	1,026
Lacey, F. C., Kybybolite	51	904
Bertelsmeier, O. O., Booborowie	92	1,090
Dunn, H. J., Black Springs	57	899
Rackham, C. Naracoorte	49	1,099
Holmes, F. A., Naracoorte	37	792
Hutchison, W. J. S., Naracoorte	35	729
"Herdsfield," Mount Gambier	86	1,207
Smith, R. L., Hynam	54	818
Gill, Mrs. J., Kapunda	43	843
Sampson, C., Kooringa, Burra	55	1,216
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	27	663
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	46	852

D. F. LAURIE, Poultry Expert.

PARAFIELD EGG-LAYING COMPETITION.

REPORT FOR FEBRUARY, 1914.

Health.—The general health of the birds has been good, although the sudden changes in temperature which have been experienced might have produced ill effects. This is an important consideration, as the birds are now in a general and seasonable moult. There were 15 deaths; six were due to heat, others to various causes.

Weather.—The weather has been very trying; temperatures ranged from 80° to 112° in 24 hours, and then a drop to 90°. These sudden changes have a bad effect on the birds. The month has been a very dry one; on the 7th, 15 points of rain were recorded. There has been a lot of wind, chiefly from the north.

Moulting.—Moulting is general, but more erratic than usual. In the various pens some birds are almost through, and others have barely started.

Broodiness.—Section 1, 20; Section 2, 34; Section 3, 6. Total for the month, 60. There has been an unusual amount of broodiness among Leghorns this year.

Egg Production.—Owing to the general moult there has been a considerable falling off. The totals show 4,656 less eggs than were recorded for January. Unless there is a decided improvement during March the averages, which were so good, will not be maintained. There are no champion pens, and very few have any staying powers.

Visitors.—Fifty-four visitors inspected the Station during the month.

D. F. LAURIE, Poultry Expert and Lecturer.

ADVISORY BOARD OF AGRICULTURE.

A meeting of the Advisory Board was held on January 14th, there being present Messrs. G. R. Laffer, M.P. (Chairman), C. J. Valentine, C. J. Tuckwell, T. H. Williams, C. E. Birks, J. Miller, F. Coleman, A. M. Dawkins, Col. J. Rowell, C.B., Professors Lowrie and Perkins, and the Secretary (G. G. Nicholls).

Publication of Veterinary Lectures.—A report was received from the Minister to the effect that it would be preferable to have articles from the Veterinary Lecturer printed in the *Journal* and issued later as bulletins, rather than to attempt to print the whole course of lectures. The lectures were varied according to local conditions and were not so suitable for printing in book form. Matter agreed to.

Proposed Duty on Super.—The Stockport and Narrung Branches drew attention to the proposal made in another State that an import duty should be imposed upon chemical manures, and asked that action to prevent such might be taken. After discussion the following resolution was carried, on the motion of Col. Rowell, seconded by Mr. Dawkins, viz.:—"That, as representative of the producers of this State, the Board is strongly opposed to any import duty on super., and draws attention to past resolutions of the Agricultural Bureau Congress and of the Board on this subject." It was then resolved that the Minister should be asked to take action, and the Secretary was instructed to confer with the Minister in respect to the circulation of forms for a petition of protest.

Wind Breaks and Shelter.—This matter was brought under the notice of the Board in a letter from Mr. Josiah Bonnin, who urged the need for action in the country between the main railway line and the River Murray, to avoid drifting of land in future years and to provide adequate shelter for stock, which would undoubtedly be carried in that country before long. It was decided to ask the Branches in that district to discuss the matter and to refer it to the next conference of the Pinnaroo district.

Life Member.—Mr. H. A. Davis, of Riverton Branch, was appointed a Life Member of the Bureau.

New Members.—The following gentlemen were approved as members of the Branches shown :—Renmark—D. D. Price, W. R. Woodham, W. Cuttle ; Berri—A. G. Hardwicke, J. Ferme ; Cherry Gardens—J. Flatman ; Lyndoch —F. Moore, L. Moore, S. Martin, A. Alexander ; North Bundaleer—A. L. Steele ; Myponga—H. Bartle, C. Muller ; Kalangadoo—D. E. Ellison ; Hartley—P. J. Clark ; Mount Barker—G. Craig, G. R. Rouse, J. E. Bruce, J. W. Brinkley, F. W. Smith, F. J. Paltridge ; Lameroo—W. Campbell, O. Meyer ; Tarcowie—A. W. Muller, T. H. Stagg, H. Edwards ; Riverton— F. K. L. Gray, H. Davis ; Mount Gambier—A. A. Kilsby, A. Manser, W. A. Palamountain.

FEBRUARY MEETING.

At the meeting held on the 11th February there were present Messrs. F. Coleman (Vice-Chairman), C. J. Valentine, C. J. Tuckwell, J. Miller, and A. M. Dawkins, Professor Perkins, Col. Rowell, and the Secretary.

Import Duty on Super.—The Secretary reported that forms for a petition had been supplied to the Bureau Branches. The Board appointed Messrs. Coleman and Dawkins to appear before the Commission, and suggested that the Director of Agriculture (Professor Lowrie) should be called to give evidence if possible.

Experimental Farms.—A report was received from the Director of Agriculture in respect to a request from the Penola Branch for an experimental farm in the drainage area, South-East. It was decided to inform the Branch that the Board could not see its way to support the request.

Export of Small and Unsound Fruit.—In respect to this matter, brought forward by the Forest Range Branch, it was decided to send with the Board's indorsement the following report, submitted by the Chairman and Col. Rowell, *i.e.* :—" The Fruitgrowers' Conference held in Adelaide in October considered it inadvisable to move in this matter. We agree that small, unsound fruit is not only a bad advertisement, but, in some instances, detrimental to the business ; but if any alteration were made we would rather that inspectors should be given power to reject immature fruit, as complaints come back every year in this respect from London. We think the co-operative packing centres are going to put the shipment of fruit on a much better basis, and they are coming fast. It is not so much a question of the size as of grading, thus securing uniformity of size and quality. The market for Tasmanian apples is just as good for small grades, for which there is a demand, provided they are uniform. To say that no apples under 2¼in. or 2½in. should be shipped in a year when the fruit, through climatic conditions, fails to come up to the usual standard, would result in the growers having to pay dead freight for much of the space previously ordered. Inasmuch as unsound fruit means diseased fruit, a good deal of dead freight would have to be faced this season, in which fusicladium is rampant throughout the hills districts, as in some gardens it would be almost impossible to get clean fruit, especially Cleopatras. Really, we consider the matter should be left alone."

Marine Fibre for Cornsacks.—Following on a suggestion from the Kadina Branch, the Secretary was requested to secure information as to the practicability or otherwise of utilising the marine fibre, such as is found at Port Broughton, for the manufacture of cornsacks.

Berseem at Roseworthy.—Professor Perkins placed before members the appended tables showing the results obtained from the two berseem (*Trifolium alexandrinum*) plots at Roseworthy College during 1913 :—

Plot I—1·336 Acres.

Cuts.	Total Greenstuff.			Greenstuff per Acre.		
	Tons	cwts.	lbs.	Tons	cwts.	lbs.
July 7th to 15th	4	17	16	3	12	80
August 21st to September 20th	15	18	19	11	18	17
October 10th to 23rd	14	3	16	10	11	105
November 14th to 28th	11	9	12	8	11	55
December 18th to 21st	2	13	64	2	0	11
Total cut	49	1	15	36	14	44

This plot was sown on March 27th. Watering was begun on April 16th. The plot was watered from June 25th to 30th, and watered between each cut with sprinklers. After the cuts had been taken off the plot carried 20 sheep for six days.

Plot G—1·865 Acres.

Cuts.	Total Greenstuff.			Greenstuff per Acre.		
	Tons	cwts.	lbs.	Tons	cwts.	lbs.
June 2nd to 17th	9	6	83	5	0	14
July 21st to August 4th	8	8	34	4	10	27
September 21st to October 10th	17	11	56	9	8	53
October 23rd to November 8th	15	8	29	8	5	32
November 28th to December 11th	9	3	104	4	18	70
Total cut	59	18	82	32	2	84

This plot was sown on March 27th, and watering was commenced on April 1st. The plot was watered between each cut with sprinklers, and, after the cuts had been made, it carried 37 sheep for seven days and 41 sheep for four days. Professor Perkins pointed out whereas the former plot had kept the dairy herd, of between 25 and 30 cows, going for from 12 days to a fortnight, the same area under lucerne had lasted only about three days. He was perfectly satisfied that four acres of berseem would keep the herd going continuously. There were very few crops, indeed, that would give 36 tons of green feed to the acre, and had plot G been better prepared the yield would undoubtedly have exceeded the 32 tons. The seeding was at the rate of 30lbs. to the acre. Fairly heavy soil was the most suitable for the clover. The seed must be sown while the ground was warm, and the plants must be showing above ground the first week in April, preferably a little earlier. Cutting should be started (under favorable conditions in about eight weeks) when the fodder was about 16in. high, and after that it could be cut regularly. He was surprised that the berseem had not succeeded better on the Murray swamps, and had suspicions that it had not received a fair chance. Personally he would not think of trying to go through a winter without it. At present, unfortunately, one of the difficulties in the way of it becoming anything like so popular as it should be was the exorbitant charge of 1s. 6d. a pound made for the seed locally. He imported his seed direct, and had it delivered at the College at under 4d. a pound.

Pigs at the Royal Show.—Professor Perkins suggested that the council of the Royal Agricultural Society should be approached with a view of securing an alteration in the schedule of prizes for pigs at the September show. He said prizes now offered were for aged and one-year boars, but in the case of sows for aged animals only. He submitted that prizes should also be awarded for one-year-old sows. The Board decided to bring the matter under the notice of the society.

New Branches.—Approval was given to the formation of new Branches, as under :—Laura—Messrs. E. G. Blesing, J. Sibly, sen., H. Hollis, G. Bundey, T. A. Sandow, R. Cleggett, sen., R. Cleggett, jun., J. H. G. Rohrlach, F. de Silver, H. Rohrlach, H. Sloan, C. Walter, J. P. Walter, W. Wilson, W. H. Campbell, R. Lines, C. Felstead, T. Hincks, A. W. Adams, J. F. Roennfeldt, W. Stevens, F. L. Bundey, W. G. Pledge, P. T. Bowker, G. E. Cleggett, J. H. Cleggett, R. J. Rose ; Mantung—Messrs. L. J. Pearce, J. P. Tonkin, F. W. Lehmann, W. Stewart, A. H. Stewart, A. E. A. Tonkin, E. Hannaford, G. N. Baker, E. Nobes.

New Members.—The following new members were approved, viz. :—Myponga—E. Baxter, J. Grant ; Two Wells—P. McLouchney ; Kadina—R. Truscott ; Woodside—P. J. Jackett, C. L. Palm ; Redhill—A. R. Barrett ; Narrung—C. Burnside, A. Allan ; Utera Plains—H. Braunack ; Keith—W. J. E. West ; Meadows—N. Masters, A. E. Maidment ; Clare—R. Hill ; North Booborowie—F. E. Waddy ; Blackwood—E. Conlon, H. James ; Quorn—J. E. Snell ; Port Broughton—J. J. Vanstone ; Kadina—M. Quinn, T. E. Ashton ; Mallala—H. Jury.

THE AGRICULTURAL BUREAU.

CONFERENCE OF NORTHERN BRANCHES.

The Annual Conference of Northern Branches of the Agricultural Bureau was held at Gladstone on Thursday, 19th instant.

The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), Professor Lowrie (Director of Agriculture), Mr. F. E. Place, B.V.Sc., M.R.C.V.S. (Government Veterinary Lecturer), and Mr. P. H. Suter (Dairy Expert), represented the Department of Agriculture, together with Messrs. F. Coleman, Geo. Jeffrey (Advisory Board), and G. G. Nicholls (Secretary). The undermentioned delegates attended on behalf of the following branches :—Beetaloo Valley—J. Joyce ; Belalie North—F. D. Bladon, A. H. Warner ; Blyth—A. L. McEwin ; Booleroo Centre—J. M. Carey, W. G. Whibley, N. L. Brooks ; Crystal Brook—W. W. Lovelock, W. W. Robinson, G. Sargent, T. L. Kelly, H. Billinghurst ; Freeling—A. J. Kuhlmann, E. Morris ; Georgetown—J. Higgins, W. B. Sanders, R. King, M. Bond, S. Eyre, E. J. Tucker, A. F. Thomson, J. Wyatt, G. Hill, J. Bond ; Gladstone—J. Growden, W. H. Brayley, K. S. Wilcox, J. A. Coe, G. A. Fisher, A. B. Blesing, R. H. Coe, T. Hollitt, E. H. Davies, J. S. Fisher ; Laura—E. G. Blesing, W. Stevens ; Narridy—W. F. Nicholls, R. M. Satchell ; North Bundaleer—J. L. Burton, C. E. Smart ; Port Pirie—H. G. Hawkins, D. L. McEwin, E. B. Welch ; Redhill—F. A. Wheaton, W. Pengilley, E. Steele ; Riverton—F. Phillips, E. A. Gray ; Saddleworth—F. H. Kelly, ; Tarcowie—J. Symons, W. S. Ninnes ; Whyte Yarcowie—E. J. Pearce, E. F. Pearce ; Yongala Vale—T. D. Keatley, C. Fowler, J. Lloyde. The chair was occupied by the President of the local Branch (Mr. R. E. Lines), the local arrangements being in the hands of the Hon. Secretary to the Gladstone Branch (Mr. A. E. Dinning).

MINISTER'S OPENING ADDRESS.

In his opening address the Hon. Minister of Agriculture said he had been associated with the Conference of Northern Branches for many years as a member of the Whyte Yarcowie Branch. He therefore felt at home amongst them. The first conference of the district in 1892 was held at Gladstone. Although the Gladstone Branch had gone into recess for a few years, he was pleased to find that it had been galvanised into life. A district like that surrounding Gladstone was altogether too good, and the farmers in it were too successful to rob the farmers of South Australia generally of the advantages of their experience and wisdom. In the formation of Branches they looked at it from a wider standpoint than mere local advantage. The influence of the South Australian Agricultural Bureau extended even to the borders of the Commonwealth itself. This institution was the envy of the Agricultural Departments of the other States.

He had perused the report of Professor Perkins, Principal of the Agricultural College, Roseworthy, and had noticed some points that would be of interest to them. There were two periods of the year during which it was essential that they should have a fair amount of rain. The first was the germination period, and the second was the close of the season. At Roseworthy this year the fall in April had been ·31, May ·31, June ·22, July ·69, all below that which they should have been. That meant that in the four months of the year in which they were expecting their heaviest rainfall at the College they only got 1½in. The average for the previous 30 years for these four months had been a little over 10in. Following this they had a very much heavier rainfall than usual in the months of August, September, October, and November. The seed had secured a poor start, and the rain forced it very quickly towards the end of the year. If they got the wheat away with a good start, it did not much matter what happened between June and December. During the year under notice red rust had been very troublesome. As a result, the yields at the College had been the lowest since Professor Perkins had been at Roseworthy. The season was peculiar, in that heavy rains were experienced in March. It did not look as though it would be safe to sow then, but those who did put in their wheats in many districts came off best.

He had pleasure in declaring the Conference open, and was especially pleased that Mr. Geo. Jeffrey and Mr. F. Coleman, who was certainly one of the leading farmers of the State, were present.

"SOIL BACTERIA."

Mr. H. Billinghurst, B.A. (Crystal Brook Branch), treated with this subject in the following paper :—" In many parts of the world, especially those where agricultural processes have been carried on for a great number of years, farmers expend large sums of money annually to maintain the fertility of their soils. Governments also have considered it incumbent upon them to establish and finance experimental stations for the purpose of constantly testing and making chemical analyses of the different artificial fertilising compounds. Speaking generally, the soils of South Australia do not at present require more than one of these artificial fertilisers, viz., superphosphate, and consequently we are not called upon to expend very much money upon any others. That our soils will not continue to answer to the calls we are making upon them for an indefinite period is certain. If means are not taken to prevent a diminishing fertility the time is not far distant when we, too, shall have to expend large sums upon artificial fertilisers other than superphosphate, as is now done in the older countries. The natural fertility of the soil depends to a large extent upon bacterial fertility, and if our soils be cared for properly the expenditure of these sums will never be needed. It is more economical to maintain the natural fertility than to apply artificial fertilisers. There is little doubt that by a series of experiments methods could be determined whereby the bacteria in the soil could be so increased and their products so utilised as to maintain, or even increase, the fertility. In the ordinary way bacteria or germs are usually spoken of as antagonistic to mankind. This is a popular error. If some varieties of a certain group of organisms are injurious it does not follow that the whole group should be so. One order of the vegetable kingdom includes the deadly nightshade and other poisonous plants, but it also includes the potato and tomato, both of which we use extensively, to our great advantage, as food products. Twenty years ago any knowledge of bacteria, outside the medical profession, was not thought of, but now almost all institutes of learning have well-equipped laboratories for the investigation of these friends and foes of man, for from comparatively recent investigations it is known that upon a knowledge of their functions depends the future progress of dairying, agriculture, preservation of foods and many other industries, as well as medicine.

WHAT BACTERIA ARE.

Bacteria are plants. Although they were formerly classed as animals, it is now universally conceded that they are plants. They differ from higher plants in that they contain no chlorophyl (green coloring matter). They resemble more closely the yeasts and moulds. There are many different varieties of bacteria; hundreds have been isolated and studied, and many more are constantly being discovered.

SIZE AND GROWTH.

In size bacteria are very small. It would take about 10,000 average-sized bacteria, placed end to end, to make an inch in length, and one and a half millions to make a mass large enough to be seen with the unaided eye. For food the requirement varies according to the species, but as a rule they require organic food, though some soil bacteria apparently thrive best, or only, on mineral foods. It is to their rapid reproduction that bacteria owe their wonderful influence in nature. They reproduce by simple division of the parent cell. The rate of multiplication depends upon food supply, environment, and species. Some, under favorable conditions, divide, thus doubling their number in 20 minutes, while some take three or four hours. They also reproduce by spores. Bacteria are everywhere, except in the interior of the earth and the upper layers of the atmosphere. A certain amount of moisture is necessary for all life. The temperature requirements of bacteria vary according to species, some sea bacteria are active at the freezing point and some soil bacteria thrive almost at the boiling point. Ordinary daylight is not as a rule very injurious to them, but sunlight has a decidedly injurious effect. It has been proved by test experiments that two hours' exposure to sunlight will kill most of them. Bacteria also require certain mineral foods and certain respiratory gases.

WHAT BACTERIA DO.

The general function of bacteria is the reduction of complex organic compounds to simple substances. Plant life is built up from the mineral substances in the soil and atmosphere at the expense of solar energy. Animals obtain their food directly or indirectly from plants. When life ceases, either in plants or animals, bacteria disintegrate the dead bodies, returning the composing elements to the soil or atmosphere, to be again used in the construction of new forms of plant life. If the destructive bacteria should cease their work the surface of the earth would be covered in a few years with mummies, unless cremation was universal. The law of perpetuity of life depends on the use of food elements over and over again. The storage of food elements in the form of mummies year after year would in time exhaust the supply, and life would become extinct. Although the general function of bacteria is destructive, there is a group that is constructive—building up simple substances into more complex substances. The problem of rendering his poor soil more productive, and his good soil better, is one in which every farmer is particularly interested. The failure of land to produce crops is not due in most cases to a lack of plant food in the soil. Chemical analyses show that in average soils there is in the top 8in. enough nitrogen to last 90 years, enough phosphoric acid to last 500 years, and enough potash to last 1,000 years. Why, then, if the soil contains such stores of plant food, does it fail to support continuous and heavy crops ? Simply because these essentials are locked up in such chemical combinations that the plants are unable to use them. The great problem, then, of modern agriculture, is not so much the conservation of plant food as the unlocking of the rich stores already in the soil, and placing them in a condition to be assimilated by plants. This unlocking process is carried on naturally by the soil bacteria. These myriads of little plants, in taking their food from the chemical compounds in the soil, produce in those compounds just the changes necessary to render them useful to the higher plants in making their growth.

NEED FOR CULTIVATION.

In the soil there must be moisture present or the bacteria will fail to grow and carry on their functions ; in fact, many of them will die, hence the necessity for the conservation of the soil moisture by frequent and thorough cultivation, not only for the benefit of the crop, but also for the benefit of the soil bacteria. The bacteria of the soil may be divided broadly into four groups, though there are some others of less importance. These four are the ammonifiers, the denitrifiers, the nitrifiers, and the nitrogen-gathering bacteria. When dead organic matter falls upon the ground it immediately begins to undergo a process of decay. Dead animals left upon the ground or buried in it are decomposed, and the elements of the animal tissue are incorporated into the soil. Manure placed upon the land rots and enriches it. Dead plants decay and become again a part of the earth from which they sprung. All this decay is brought about by bacteria assisted by the elements. The first change that takes place is a breaking down of the complex nitrogenous substances. The result of this breaking down is to resolve the nitrogenous substances into free ammonia and other simple compounds. Now, ammonia is a very valuable ingredient in the soil, for on becoming oxidised it is immediately available as plant food. A series of experiments to test the amount of ammonia produced by bacteri were conducted at the Michigan Agricultural College and demonstrated th advantage of a bountiful air supply. Four sets of tests were conducted in flasks. In the first all oxygen was removed, in the second the flasks were sealed with wax, in the third they were plugged with cotton wool, and in the fourth they were thoroughly aerated. After 11 days a careful examination was made. In the flasks devoid of oxygen only the merest trace of ammonia was found, while the others all showed ammonia in larger quantities, the amount increasing steadily and consistently with the increased amount of oxygen supplied. This, then, shows the second reason for frequent and thorough cultivation, *i.e.*, that the soil should be aerated as effectively as possible, that the maximum amount of ammonia may be produced by these bacteria.

THE DENITRIFIERS AND NITRIFIERS.

These bacteria carry on a process of nitrate destruction. They attack the nitrates in the soil, reducing them to nitrites and free ammonia, and sometimes resulting in the liberation of free nitrogen—a serious loss. Fortunately, however, research has taught us that these bacteria work best when oxygen is excluded. If the soil is allowed to become packed and hardened through lack of cultivation the air is excluded, and one of the conditions favorable to denitrification is furnished. This provides a third reason for frequent and thorough cultivation, *i.e.*, to prevent the loss that might be caused by the action of the denitrifying bacteria. Opposed to the above nitrogen waste another process which is being carried on simultaneously is nitrification or nitrate building. In most species of plants the nitrogen necessary for their growth must be in the form of nitrates. The nitrifiers seize upon the ammonia which is formed by the degradation of the complex nitrogenous bodies by the ammonifiers, and by the addition of oxygen to it they form nitric acid, which combines readily with chemical bases in the soil to form nitrates, thus placing the nitrogen at the disposal of the plants. The nitrifying bacteria differ from the preceding classes in their food requirements in that, whereas the ammonifyers and denitrifyers require at least a trace of organic matter for their best development, the nitrifyers do not require organic matter; in fact, they are incapable of growing in the same, although its presence in the soil does not prove fatal to their existence. Also, they require an abundance of oxygen. Hence a further necessity for thorough cultivation in order to afford this supply.

LEGUMES.

Crops of leguminous plants, such as peas, beans, vetches, clover, lucerne, etc., do not exhaust the soil in the same way as many others, such as cereals, root-crops, &c. This knowledge has long been made use of in the rotation of crops, but until recent years its true significance was unknown. When seeds of plants not being legumes are placed in soil entirely destitute of nitrogen, but containing all the other chemical elements necessary for plant growth, they start to grow, but as soon as the food material stored up in the seed itself is exhausted the plants wither and die. On the other hand, if seeds of legumes are placed in the same soil, they also make a start. Then they begin to wither, and undergo a period of " nitrogen hunger," after which they revive and make a vigorous growth. If examination is made of the roots of peas, beans, and other plants belonging to the leguminous family, there will be found on the roots small tubercles or nodules. When cut open and examined under a microscope these are found to contain myriads of bacteria, which possess the property of extracting free nitrogen from the air. Besides gathering the free nitrogen from the air these bacteria cause the nitrogen to unite with substances such as calcium, magnesium, and potassium in the soil, and so form nitrates suitable for plant food. The legumes then use part of this food in their own growth, both in the tops and roots of the plants. Here, then, is still another reason for thorough cultivation, viz., that these bacteria may have a supply of air from which to extract the nitrogen. It will now be seen how it is that a crop of leguminous plants leave the land richer than it found it. The tubercles on the roots vary in size according to the variety of the legumes, being especially small in the clovers, and very large—about the size of a pea—on cowpeas, and some of the larger beans.

OTHER BACTERIA.

Besides those already enumerated there are other bacteria which, by their action upon the complex substances of the soil, change those substances into potash compounds, sulphates, phosphates, and silicates readily available as plant foods. It will thus be seen what an important part these tiny organisms play in plant life. Nitrogen in the soil is being constantly used up by growing crops, by leaching, by our system of bare fallow, and by other means. Very little of the supply of nitrogen in the soil is immediately available as plant food. So the inevitable conclusion is that sooner or later the problem of replenishing the supply will be before us. Then the question will be—How shall that replenishing be accomplished ? Nitrogen may be bought in the markets in such forms as sodium nitrate (containing 15 or 16 per cent.

of nitrogen), ammonia sulphate (containing 20 to 21 per cent. of nitrogen), and dried blood (containing 12 to 15 per cent. nitrogen); but, when we bear in mind that such commercial nitrogen costs about 10d. or 11d. a pound, and that 1bush. of wheat contains about 1lb. of nitrogen, it will be seen at once that the purchase of nitrogen cannot be considered practicable in general farming. Considering all these facts, and the additional facts that there are about 75 million pounds of atmospheric nitrogen resting upon every acre of land, and that it is possible to obtain unlimited quantities of nitrogen from the air for use of farm crops, and at very small cost, the inevitable conclusion is that the inexhaustible supply of nitrogen in the air is the store from which we must draw to maintain a sufficient amount of this element in the soil for the most profitable crop yields.

CONCLUSIONS.

There is absolute necessity for frequent and thorough cultivation of the soil—(1) To supply and maintain a sufficient quantity of moisture for the growth of plants and for successful bacterial activity. (2) To thoroughly aerate the soil; (*a*) to supply oxygen for the ammonifying and nitrifying bacteria; (*b*) to check the injurious activity of the denitrifying bacteria; (*c*) to supply nitrogen for the nitrogen-gathering bacteria; and there is urgent need for the careful study and for exhaustive experiments to ascertain the best, simplest, and least costly means of inducing the greatest possible activity of the bacteria of the soil.

DISCUSSION.

In the discussion which followed, Mr. F. Coleman (Saddleworth) emphasized the need for the farmers experimenting largely if they desired to solve many of the problems which at present confronted them. On his property, over a period of 10 years, bone super. had given better financial results than mineral super., and he suggested that others should try its effects comparatively. (Hear, hear). The Director of Agriculture (Professor Lowrie) complimented Mr. Billinghurst upon his address. There were many things which still puzzled them in relation to the soil. Some men, for example, year after year took off crops, burnt the stubble, and fallowed, and yet obtained regularly returns equally as good as were secured by those who cropped with cereals only once every three or four years. The trouble in their cases would probably come—not so much in the matter of lost nitrogen—as in the detrimental effect, through the loss of humus, upon the physical condition of the soil. It was quite likely that the continued thorough working of the land would ensure the maintenance of the nitrogen supply, but it was certain that such a practice would lead to the depletion of the humus. The question was, when they had used up that humus would the direct acquisition of nitrogen keep pace with the demand. In the northern areas particularly, it was absolutely essential to conserve as much moisture as possible, and the best agency in that connection—quite apart from its nitrogen content—was humus. In Mr. Coleman's case it appeared as though the trace of nitrogen in the bone super. accounted for the superior financial results. If everybody used this fertiliser extensively, however, the time would soon come when there would not be nearly enough to go round, and the price would rise to a prohibitive degree.

FEEDING COWS FOR MILK PRODUCTION.

The Dairy Expert (Mr. P. H. Suter) contributed an address on this subject. He said this State cannot claim to possess such favorable dairying conditions as exist in the Eastern States, New Zealand, or Denmark. There the rural population is blessed with not only fertile soil, but natural pastures, the result of a good rainfall, nicely distributed over many months of the year. There the cow enjoys an ideal life and yields liberally. Only in limited areas can we dairy profitably without recourse to a freer use of the plough and growing of special crops for conservation to feed in times of scarcity. I am well aware of the great disadvantages under which we raise and market dairy produce, but hold the opinion that we can do better, for we have in the State people quite as industrious and intelligent as in any other country, many of whom are doing good work in spite of all the drawbacks.

I need not remind you that this State is subject to periods of drought, when there is a scarcity of natural food suitable for the dairy cow. During these periods of shortage of green food, dry pastures only are obtainable, and these often are inadequate to satisfy the body demands, and certainly insufficient to stimulate a vigorous milk flow. At such times we find many totally unprepared, and thousands of good cows perish.

During the flush or spring months the cows milk well, for there is nothing better than good natural pasture to produce heavy yields of milk and butter of the finest flavor. This is on account of its being in proper condition, palatable and succulent, and having the right proportion of food elements present, viz., protein, &c. It is with the hope of stimulating some to provide their cows with a sufficient and suitable food ration, that I have chosen as my subject, "The feeding of dairy cows." This is the weakest spot in Australian dairy practice ; it is more important, I feel, than breeding.

The high price of land, labor, and increased taxation make it very necessary that those keeping dairy cows should adopt more approved methods. Practically one-half of the cows kept are short of sufficient food to maintain condition, much less to make milk to profit. Such cows, when freshening or calving, are brought in to be milked and usually receive a little extra food. This food is used almost wholly to satisfy the body wants, being directed to replenish waste tissue before any goes to milk production. The right kind of cow, fed to her full capacity with suitable food will show a substantial profit, but a poor or wrong sort fed to its capacity with the same food will not yield milk to profit. I do not propose to go into the question of increasing the fat content of milk by feeding; there is a wide difference of opinion held by cow keepers on this point. I will just here say that by no method can the fat content be permanently increased. A cow weak and in low condition owing to insufficient food cannot be made to increase the fat content until a normal condition is reached.

After most exhaustive experiments, various food standards have been laid down. Assuming that a dairy cow has a live weight of from 800lbs. to 1,000lbs., and is producing 3galls. of milk daily, she will require the following ingredients or nutrients in her daily ration:—Dry matter, 25lbs. to 28lbs.; protein, 2lbs. to 2·5lbs.; carbohydrates, 12lbs. to 15lbs.; fat, ½lb. to ¾lb. And of these the body demands for maintenance—Fat, ¼lb.; dry matter, 13lbs.; protein, ¾lbs.; carbohydrates, 7lbs. The full amount is required for the following purposes:—(*a*) To replace waste tissue; (*b*) to produce heat for the body; (*c*) to supply building material, such as muscle, bone, hair, flesh, &c.; and (*d*) for the formation of milk.

For the purpose of considering the value of a food, fat and the carbohydrates may be grouped together, 1lb. of fat being equal to 2½lbs. of carbohydrates. For milk production we require for every 1 per cent. of protein 6 per cent. of carbohydrates; consequently, to gauge the value of a food as a milk producer we must consider the proportion in which the nutrients are present. Very few foods contain them in the best proportion for milk production, one exception being natural mixed pasture. The value of the majority of foods must therefore depend upon the possibility of mixing them with other foods, in order to have the carbohydrate and protein in the right proportion. This is referred to as the nutritive ratio.

Let us take, for example, wheaten hay and wheat straw. The composition is as follows:—Wheaten hay); protein, 3·6; carbohydrates, 46·1; fat, 1·1; nutritive ratio, 1 : 13½. Wheaten straw; protein, ·4; carbohydrates, 36·3; fat, ·4; nutritive ratio, 1 : 93. Such bulky foods fed alone are not good milk producers, because they are not concentrated enough, and do not contain the protein and carbohydrates in right proportion. Hay is very much superior to straw; nevertheless, the hay has too little protein and must be mixed with concentrated food rich in protein and fat, such as bran, linseed, lucerne chaff, &c.

There are a number of concentrated foods which can be used on the farm, viz.:—Oats, which is an excellent grain for feed; the husk, whilst carrying a little nutriment, renders it a food of light character and of easy digestion. Soaked wheat can be used at the rate of 4lbs. morning and night. Lucerne—Every ton of lucerne hay grown upon the farm and well prepared has approximately an equivalent value of a ton of bran. Soaked barley is a rich food, and is largely used in Denmark for feeding dairy cows in conjunction with oats; I do not recommend exceeding 6lbs. daily. Peas are excellent food for dairy cows; give them 2lbs. morning and night, crushed. When values are low these can be fed instead of bran. These foods, and also linseed, oilcake, lucerne chaff are too valuable in protein content to be fed alone in large quantities, and must, therefore, be fed with cheap bulky foods, such as straw, hay chaff, and cocky chaff; the latter, being deficient in protein content supplies at little cost all the dry matter and carbohydrates required by dairy cows.

Thus the farmer can produce the bulky food at a minimum of cost. Where peas, lucerne, or any leguminous crops are grown the necessity for purchasing bran, &c., is lessened.

Protein is the nitrogenous matter contained in food stuffs such as bran, lucerne, peas, beans, all leguminous or pod-bearing plants, and goes to the formation of muscle, flesh, and milk.

Carbohydrates and fat are mainly utilised to supply heat and energy and increase of weight. Foods such as oilcake, maize, potatoes, carrots, sugar beet, and sorghum have a high percentage present, but are deficient in protein content.

The composition of vegetable bodies and animal bodies is much the same, and every element or nutrient in the animal body must be given in the food supply. The value of the food depends upon the relative proportion of the three classes of digestible elements they contain.

It is due to protein, carbohydrates, and fat being in right proportions that our natural pastures are so excellent as milk makers. There are only 3½lbs. of protein contained in 100lbs. of chaff, whilst there are over 46lbs. of carbohydrates. So, for a cow to get sufficient protein to make 4galls. of milk she would have to consume nearly 90lbs. of chaff daily; carbohydrates would then be wasted, for the cow could not utilise these profitably, seeing that she only requires, say, 15lbs. daily. In 100lbs. of wheaten straw there is only about ½lb. of protein, and as a cow requires, say, 3lbs. to make 4galls. of milk, she would have to eat 600lbs. of straw to get sufficient protein. Such are termed bulky foods, and must be mixed with concentrates.

A cow in full milk will require for a day's ration (if either wheaten chaff or straw are to form the bulk, and oilcake the concentrate) the following, viz.:— 16½lbs. of wheaten chaff and 12½lbs. of copra oilcake, or 16½lbs. of straw and 16lbs. of copra oilcake.

From this it will be seen that the 100lbs. of wheaten straw requires to be supplemented by 22lbs. of copra oilcake to make it equal to 100lbs. of wheaten hay. In the first mixture there are six daily rations, viz., (6) 16½lbs. of hay —100lbs.; (6) 12½lbs. cake—75lbs. However, such a ration is unsuitable, as so much oilcake would sicken the cow, but it is given to show the comparative values of the different foods.

In determining the quantity an animal is to have, regard must be had to what the beast is expected to do with the food. In the case of a mature animal neither milking, growing wool, being fattened, not doing work of any kind, food to supply heat for the body, and to replace any small waste going on, only is required. The amount of food would almost entirely depend upon the size of the animal; if it is 1,200lbs. weight it would require twice as much as a 600lb. animal. That is really a maintenance ration. Young growing animals must be fed with rich food containing all the ingredients necessary over and above maintenance. An animal being fattened must have an excess of carbohydrates.

Finally, in the case of cows giving or expected to give milk, a productive ration is required, for the caseine and albumen in milk is made from protein, and the fat and the sugar from the carbohydrates, all of which were originally assimilated from the food consumed, then manufactured into blood, and finally into milk. If, however, sufficient nutrients are not supplied to maintain the body wants and the production of milk, the cow may give a little milk at the expense of her vitality. Under such circumstances the cow loses weight or condition, becomes poorer, miserable, and non-profitable. A cow having been a very generous milker and used to good feeding, will often continue to yield milk, sacrificing her body, and practically milk herself to death. If no feed is available I recommend farmers to cease milking the bulk of the cows. Select those most recently calved, or the best, and feed them properly.

Under generous feeding the cow is stimulated to heavy milk production. Cows kept in a semi-starved state must quickly decrease in their yields, but many continue to yield some milk whilst undergoing this starvation. As milk is designed for the support of the young calf, nature has provided for its supply to the limit of animal endurance.

The ration fed to the dairy cow must not only contain the food ingredients to allow of her performing the work required of her, but it must be palatable and succulent, otherwise she cannot relish it. Palatability and succulence of the ration is essential, as it ensures better digestion by way of creating an active and vigorous secretion of the digestive fluids of the stomach. This can be readily supplied by feeding any green crops, ensilage, mangolds, pumpkins, piemelons, or damping the feed with molasses and water.

Farmers, when asking their horses to do the extra cultivation of the land, always see to it that they receive more grain and less bulky food. So it should be with the cow; a portion of her food must be concentrated, and it is indeed well to aid her by reducing the food to a condition readily consumed and assimilated, be it grain by crushing, or hay by chaffing, &c. As a rule, when feeding, provide as much roughage with succulence as a cow will consume, and sufficient concentrates to bring her ration up to a required standard. The true value of the cocky chaff and the various straws as food is not sufficiently appreciated. They are made very valuable when properly fed to cows with richer foods. Their composition varies very considerably.

Pea straw is very valuable, then comes in order of merit oaten straw, cocky chaff, barley, and wheaten straw. In feeding these it pays to sprinkle with molasses, diluted with hot water the afternoon previous, each day's requirements. If molasses is not used I recommend linseed made into a very thin gruel, diluted with hot water, the cocky chaff, &c., being saturated with this. Also, mix an ounce of salt with every gallon of water. This stimulates the appetite and aids digestion. The addition of the hot water, &c., creates a slight fermentation and makes it much more palatable for the stock.

Pure water is almost as important in milk production as the food a cow consumes. She will drink on an average 4galls. of water to every gallon of milk she secretes. In every 100lbs. of milk there are 87lbs. of water, and bad, stagnant water means less milk, poorer flavor and keeping quality, and the cows lose condition.

In my list of food compositions I have taken cocky chaff as equal to the average of the straws; thus it is only approximate, no analysis having yet been made in Australia so far as I am aware.

Some most valuable work carried out at the Agricultural College by Professor Perkins and his staff distinctly showed what wide differences obtained in the food value or percentage of digestible nutrients contained in hay cut in full bloom, and that cut when more advanced in maturity; a difference of 12 per cent. was found in the digestiblity of the ingredients, principally protein—our most valuable ingredient—thus lessening its food value considerably; and that cut at a later period was also accompanied by a loss in weight.

It does not matter how good a dairy cow may have proved herself, unless she receives a suitable daily ration in excess of maintenance she can prove but little, if any, better than the greatest scrubber. There are many factors which must be observed if money is to be made from cows—(1) Feed good cows generously with suitable food, viz., a ration containing not only the ingredients necessary to maintain the body; go further, supply more, and produce milk. (2) Study foods and their value, provide good water.

TABLE I.

The dairy cow, weighing approximately 1,000lbs. live weight, and yielding 3galls. daily, requires in her daily food ration the following food nutrients :—Dry matter, 25lbs. to 28lbs.; protein, 2lbs. to 2½lbs.; carbohydrates, 12lbs. to 15lbs.; fat, ½lb. to ¾lb. The body requires—Dry matter, 13lbs.; protein, ¾lb.; carbohydrates, 7lbs.; fat, ¼lb. Amount available for milk production—Dry matter, 12lbs. to 15lbs.; protein, 1¼lbs. to 1¾lbs.; carbohydrates, 5lbs. to 8lbs.; fat, ¼lb. to ½lb. Each pound of milk produced (after the body demands are satisfied) requires—Dry matter, ·46lb.; protein, ·067lb.; carbohydrates, ·26lb.; fat, ·02lb.

TABLE II.

Economical maintenance rations suitable for northern dairymen, who wish to save their best cows during times of drought—The cows should not be milked unless the owner provides increased food containing the ingredients (note in Table I.) required to produce 1lb. of milk. All these rations should be damped with hot water. No. 1—16lbs. wheaten straw, 20lbs. pumpkin, 3lbs. copra cake; cost, 5d. per day. No. 2—12lbs. wheaten straw, 4lbs. wheaten chaff, 5lbs. bran; cost, 4d. per day. No. 3—12lbs. cocky chaff, 4lbs. wheaten chaff, 2lbs. copra cake; cost, 4d. per day. No. 4—20lbs. cocky chaff, 2lbs. bran, 2lbs. linseed; cost, 4d. per day. No. 5—10lbs. wheaten straw, 5lbs. wheaten chaff, 3lbs. bran, 1lb. copra cake; cost, 3½d. per day. No. 6—20lbs. wheaten straw, 2lbs. linseed; cost, 3½d. per day.

TABLE III.

Rations which can be Fed for Milk Production (Northern Areas).—No. 1—15lbs. wheaten and oaten chaff, 4lbs. oaten straw, 8lbs. bran, 2lbs. copra cake; cost, 11½d. per day. No. 2—10lbs. oaten chaff, 8lbs. lucerne chaff, 6lbs. crushed barley, 4lbs. bran; cost, 8·8d. per day. No. 3—16lbs. oaten chaff, 6lbs. crushed barley, 6lbs. bran, 1lb. linseed; cost, 10½d. per day; No. 4—20lbs. pumpkins, 10lbs. wheaten chaff, 5lbs. straw, 7lbs. bran, 2lbs. linseed; cost, 9½d. per day. No. 5—25lbs. piemelons, 8lbs. wheat, 12lbs, chaff, 5lbs. straw, 2lbs. copra cake; cost, 11d. per day. No. 6—30lbs. green lucerne, 12lbs. wheaten chaff, 5lbs. oaten chaff, 6lbs. bran.

DELEGATES' VIEWS.

Mr. F. H. Kelly (Saddleworth) mentioned that he had found the straw of Le Huguenot wheat preferable to any other for feeding to cows; sheep also took to it very readily.

Mr. A. L. McEwin (Blyth) agreed with the view of the Dairy Expert that dry bible was due to bad feeding. He was strongly opposed to the practice of giving cows extra feeding within three weeks of calving.

Mr. Kelly asked whether it was advisable to have rock salt always available for cows. Mr. Suter said it should be there, if the cow wanted it she would lick it; if not, she would leave it alone.

Mr. E. H. Davies (Gladstone) asked whether better results were obtained with milking machines or with hand milking. Mr. Suter replied that good hand milking was best. Some milking machines were absolutely useless. Others were very useful if the cows could be kept up to 3galls. of milk per day. Under present conditions, where a man was milking 10 or 15 cows, he was better off without the machines.

Mr. E. B. Welch (Port Pirie) asked what food should be given cows that were running on saltbush country, that caused them to scour badly. Mr. Suter said a little cocky chaff and pollard fed at night would have a good effect. Saltbush contained a large percentage of protein.

AFTERNOON SESSION.

LUMPY JAW.

Mr. F. E. Place, B.V.Sc., M.R.C.V.S. (Government Veterinary Lecturer), delivered an address as follows :—" In venturing to occupy the attention of the delegates for a little while with lumpy jaw, I offer no apology, because I have during the last two years found that in the northern districts there is a good deal of lumpy jaw ; and I trust the explanation now to be given will tend to somewhat allay the feeling which the subject has aroused, and at the same time throw a little light on the matter. It will be noticed that there is no limitation in the title of the subject to any particular class of stock, because it is not intended to limit the remarks to cattle only, but to endeavor to show that other stock may also be involved in the disease. Also, at the outset it must be made plain that the common forms of lumpy jaw cover three classes of diseases which are notifiable under the Stock Diseases Act in this State, and that it is every one's legal duty to immediately notify the Chief Inspector of Stock, Adelaide, and the nearest local inspector, which would be at Gladstone, Quorn, or Gawler, of the existence of a case of lumpy jaw, so that an inspection may be made and advice given as to the disposal of the beast, pending which procedure the animal should be kept from contact with others. These regulations are framed entirely in the interests of the stock owner, and it is to be hoped that the reason for them will become apparent as the explanation proceeds. They are not irksome, and the due fulfilment of the requirements of the Act is a social duty, because lumpy jaw may mean tuberculosis, the congener of consumption among ourselves, or actinomycosis, which frequently results in fatal liver abscesses among men, or cancer, the very name of which is fraught with horror. While on the other hand the use of such a loose expression as 'lumpy jaw' may mean no more than a glandular swelling due to the irritation of the bail, or an abscess produced by the presence of grass seeds in the soft structures of the throat. One desires to be able to separate the virulent from the harmless. To do this a little anatomical knowledge will be found useful, for if one looks at a beast's throat, especially if it is thin skinned, like a Jersey cow, one can see lying between the jaws, two glands or kernels, and can also discern behind and below the ears outlines of similar organs. Portions of these glands are lymphatic glands, or in plain words, filters and traps for catching germs ; but they are more than this, for they are outposts of the defensive forces of the body, garrisoned by cells whose duty is to seize and devour the invader, so that many a hard-fought fight is waged in these barbicans of the body, and assailer and assaulted lie dead side by side in huge numbers, so that there is swelling, pain, and tenderness. If the cause of the attack is little understood by the defending cells, reinforcements are called up to hold the outer walls, and one finds the glands showing beneath the skin as hard kernels, freely movable on the softer structures among which they lie, the result of irritation such as of a sharp-edged bail, or that abomination, the stick wired on. Now such irritation will not in itself produce either tuberlosis or actinomycosis, neither will it in the course of an ordinary beast's life induce cancer; but it is hard to conceive why a beast should be made to suffer in such a way. Facing the matter from a purely practical standpoint, such irritation is not conducive to the economical production of either meat or milk, but as it is not a disease notifiable under the Act, it is likely to continue indefinitely; it is doubtful whether there would be a single case if the actual loss produced in this way could be tabulated and expressed in terms of £ s. d.

GRASS SEEDS.

"Then comes the much-debated grass seed abscess. The symptons of this are manifest discomfort long before any external swelling is visible; the husky cough, the dribbling from the mouth, and poking out of the tongue at times, and then the external swelling, at first ill-defined, but later sagging between the jaws, hardish on the outside because of the thickness and tenseness of the skin, but if grasped will be found to fluctuate and not attached to the sides of the jaw or involve any well-defined enlargement of the glands, because their structure is being broken down. Later, if nothing is done, the abscess will possibly burst, and a free discharge of matter occur. What has happened is that grass seeds have found entrance, possibly through the ducts under the tongue through which saliva reaches the mouth, or possibly through the wound in the jaw caused by a new molar being cut, or by the side of an old one loose in its socket, and the soldier cells of the glands, ever on the alert, have called up reinforcements to repel the invader; but the bulk of the latter has been too much for them and the camp followers of the foe, the ever present germs which make pus—the staphylococci and streptococci—have battened on the corpses of the defenders, utilising also the rotting stalks of the enemy as food, till the whole area has become one mass of putridity, as is clearly evidenced by the stink of the discharge, followed in many instances by the rotten grass seeds. Here is a case for the amateur surgeon, if the value of his beast and the distance from a veterinary surgeon do not warrant calling him in; and the requisites for the operation are a bold mind and a sharp clean knife. The animal is secured in any way that can be relied upon, the Swedish triple hitch is probably as easy and good as any, and the knife is driven well into the abscess. From below a good big cut of quite an inch or more in length is made to let the matter out. When it has finished draining, the hole it leaves wants well swabbing out, and with the fingers or forceps, made possibly out of a bit of fencing wire, the grass seeds should be cleaned out, after which the hole should be well swabbed out with any strong antiseptic, such as washing soda, Stockholm tar, or any carbolic preparation such as lysol, cyllin, &c., used in quite 20 per cent. strength, and further treatment will not be needed. Should it be, however, for any reason, then probably a further application of Stockholm tar will meet the case. There is no advantage in leaving grass seeds to be their own surgeons. Take the thing early and do it well.

TUBERCULOSIS.

"Now we come to the diseases with which the Stock Department will deal on receipt of notification. First of all the lumpy jaw of tuberculosis gradual in its onset and causing enlargement of the glands between the branches of the lower jaw or below the ear, with accompanying cough, especially when the animal is hustled ; the bright tubercular eye, and possibly, though not always, the wasting and scouring that so often accompany the disease. The swelling is very different from that just described ; each gland is enlarged separately, often unequally, and it can be felt distinctly in the hard fibrous case, movable, not adhering to the bone at all, and in extreme cases going on to suppuration ; but the matter will not have the foul stench of the grass seed unless there happens to be a complication of such, and the other symptoms of the disease will ratify the opinion formed. Should there still be doubt, the Stock Department would be able to settle the matter definitely by applying the tuberculin test, which, however, is rarely required, the inspectors being men of experience and well able to detect the disease. If the disease is localised to the glands of the throat, they would probably pass the rest of the carcass for food, destroying only the head or parts affected. In these days when everyone talks glibly of bacteria and bacilli, one may be forgiven for just mentioning that that kaleidoscopic science, bacteriology, has decided that the well-known bacillus tuberculosis is not a bacillus at all, but one of the family of discomyces, or mould-like fungi to which the actinomyces also belong, likewise the blue mould on harness ; and Metchnikoff, who was going to turn us all into centenarians with sour milk, suggests that in honor of its discoverer it should be renamed *Sclerothrix kochi.* But amenities of this sort have little interest for the man on the land, and it is much more important to remember that the discharges from a beast with tubercular lumpy jaw are highly virulent to others of its kind, especially calves and young stock, who, obtaining them either on their food or breathing them in, will rapidly contract the disease, and in their turn pass it on to others. Waiving for the nonce the question as to whether the disease is transmissible from man to beast or beast to man, one is faced with the stern fact that its existence means diminished profits—possibly 2 per cent., possibly 20 per cent. ; but in either case stock-breeding is not so profitable nowadays as to be able to pay a tax of that sort, especially when with a little care the disease can be stamped out, conditions in South Australia being especially favorable for so doing, and the vigilance and skill of the Stock Department ever ready at the stockowner's call.

ACTINOMYCOSIS.

Actinomycosis will be shown by the somewhat rapidly growing lump, generally on the side of the jawbone, inside or out, but firmly connected with the bone, and eventually breaking and discharging a whitish stringy matter practically without smell, unless, again, there are complications of grass seeds. This matter has a distinctive characteristic, which allows one to diagnose the disease even by the naked eye. If a little fresh matter is collected on a piece of glass, such as a microscope slide, and squashed out with another piece, small whitish or sulphur-yellow specks may be discerned, varying in size up to a millet seed. These are colonies of the fungus actinomyces, but in a degenerate state, and very likely to be destroyed by the pus-forming germs in the matter; hence the necessity for examining the fresh discharge at once. Under the microscope they are distinguishable as masses of club-shaped moulds which were taken to be the casual organism of the disease, but they are now known to be degenerate forms of discomyces similar to the one of tuberculosis, and very nearly allied to the organisms often found in the mouths and throats of men and animals which produce the white cottony growths sometimes called thrush. But while our knowledge of tuberculosis informs us that the germ almost invariably requires a living animal body in which to grow, that of actinomycosis lives freely upon cereals and grasses, especially those possessed of awns like barley and barley grass; and undoubtedly man becomes infected in most cases directly from the vegetable saprophyte by inhaling dust while threshing. But once the organism obtains an entrance to the body, be it animal or man, it will not stay in the jaw only, but become generalised in the lungs, pleura, liver, and so forth, and causes many deaths in man from liver abscesses with which it is not always credited. But it may be argued, 'why worry about it in cattle if the source is common to them and men from grasses?' For this reason, that the germ passing through the animal body becomes modified in its virulence, but passing from the animal to the plant again becomes more virulent; so that the lumpy-jawed beast scattering the germs is a very real menace, both to its own kind and to the human race as well, and, therefore, apart from the legal necessity to do so, he should be knocked out at once. Unfortunately, in South Australia, there seem to be different species of the discomyces which sometimes cause confusion in the mind of the owner or inspector, as the symptoms do not run a regular course; but in such cases it would be better to take the view that it is actinomycosis and get rid of it. The germ has a great resistance to heat, and for this reason is found in dry, hot districts, where one would hardly expect to be troubled by such forms of life. It will be readily seen from the foregoing that the connection between grass seeds and actinomycosis is likely to be a very intimate one, and such is really the case, so that an apparently simple case of grass seed abscess may readily become the focus of an actinomycotic growth; and this should never be overlooked. From a practical point of view slaughter is by far the cheapest way of dealing with this disease; but from some curious perversity of human nature, a cow has only to get a lumpy jaw to immediately become, in the owner's eyes, the most valuable beast in his herd. Her price, like that of Solomon's good housewife, is above rubies, and demands for treatment are loud and long. This, being a matter entirely for the Stock Department to decide, need not detain us now, beyond saying that the disease is in some cases amenable to treatment, and that the cost of such is generally more than the market value of the beast, without considering time or risk.

CANCER.

"Now just a word or two about cancer. It is generally conceded by present-day scientists that the various forms of cancer are produced by the cells which make up the tissue running riot, and not to germs of any specific nature, but the cause of this mad suffragetism among the cells is prolonged irritation; and in grass seeds, actinomycosis germs, and so forth we have just the class of irritant that is likely to set up cancer, and, as a matter of fact, often does. The hard, bony swelling which accompanies lumpy jaw is known as *Osteo sarcoma*, and by the courtesy of a practitioner in a neighboring town I have lately become possessed of two highly interesting photographs of *Osteo sarcoma* on the jaw of a 4-year-old filly, in which the cancer growth is hugely developed, giving every indication that the origin of the mischief was the actinomycosis fungus. If the outcome of this dissertation is to call the attention of stockowners to the folly of keeping lumpy-jawed beasts about, the speaker's object will have been attained; but in closing, he would once more remind them that it is not a matter of personal like or dislike, but a matter of social duty and legal requirement that such cases should be brought under the notice of the Stock Department without delay. He does this with the more emphasis because, as an officer of the Agricultural Department, his rights and duties are just those of any other private individual, but his knowledge of the mischief the diseases commonly called jumpy jaw do makes him urge stockowners to endeavor for their own interests to stamp them out."

Mr. F. D. Bladon (Belalie North) asked whether cancer could be eradicated from the jaw of a horse by means of an operation.

Mr. Place said there was no reason why this should not be done. Cancer was a riotous growth of the tissue of the part, and if they cut out all the cells they should be rid of the trouble. Success only followed early operation, however.

Mr. W. Ninnes (Tarcowie) had a bullock with a lump on the jaw. About 12 months ago he destroyed the animal and burned the head. Just lately he examined the bone of the jaw, and the growth seemed to have begun from the inside of this.

Mr. Place said this was a typical case of actinomycosis. The germs had evidently entered through an opening into the jawbone, and multiplied there.

Mr. G. Jeffrey (Advisory Board) referred in eulogistic terms to the address of Mr. Place.

In reply to Mr. Kelly, Mr. Place said there was an analogy between the lumpy jaw and fistula in horses. When an injury occurred where the blood circulation was slow, the act nomycosis fungus grew, and the result was a continuous breaking out and running, unless they cut well down into the tissue, and followed down every pipe, scraping away any diseased bone or tissue. The wound should then be irrigated for half an hour, or an hour, per day.

BULK HANDLING OF WHEAT.

This subject was dealt with in a paper by Mr. F. H. Lock (Whyte-Yarcowie), which read as follows :—" The present system of handling and marketing wheat is expensive, wasteful, and unscientific, and with it we cannot expect to get the best results. The conditions of handling and marketing under the bulk system are as far in advance of it as the modern drill and harvester are in advance of the old seedsower and mower. The fact that over 80 per cent. of the wheat imported into Great Britain arrives in bulk, and that much of the Australian wheat arriving there is handled in bulk by the bags being cut in the holds, goes to show the general acceptance of the bulk system at one end, whilst the fact that most of the wheat in Russia, U.S.A., Canada, and Argentina is shipped in bulk proves that it is just as acceptable to the grower. The adoption of the bulk system not only involves a change in methods of handling, but would practically alter our whole system of marketing. The change should not take place until serious consideration has been given to the cost thereof from every point of view. South Australia is lagging behind in this question. New South Wales is launching out on a scheme of her own, and Victoria is seriously considering ways and means, whilst in each of these States the handling and storing in bulk is practised by different milling firms. Much could be said against the present system, but it would be the ' old, old story,' so it is enough to say that so long as any system puts a premium on malpractices, whether great or small—and our present system most certainly does—many peoples' honesty will be strained to breaking point; and further, the farmer undoubtedly gets the worst of the deal. That the introduction of the system of bulk handling in this State is fraught with many difficulties is without question; but they are not insurmountable. Other countries where this system is in operation have overcome similar difficulties. The cost of the scheme in its entirety—as we see it in America and elsewhere—would be considerable, but no one would dream of launching the whole scheme in one act. It would be far more reasonable to spread the cost over a number of years; then it would not be burdensome. Certainly in considering the cost thereof we must place against it the annual expenditure on bags (for the other charges will be about equal for both bags and bulk), and the fact that bags are an ever increasing outlay, whilst the elevator would be a permanent asset once erected. If a sum equal to that lost by the farmers annually on bags, viz., £145,000, were put into installing the bulk system each year, in 10 years this would mean about £1,500,000, which would give us at least a fairly up-to-date elevator system in this State. In America the elevators are owned by the railways and worked under Government inspection, the railways there being privately owned. Here, where our railways are the property of the State, the elevators should be a State enterprise, and if it pays the railway companies of America to put the money into it—as it unquestionably does—it should certainly pay as a State concern here. One of the difficulties as regards this State is the number of ports where wheat is loaded direct for export; but more than two-thirds of the wheat exported goes from three, viz., Ports Adelaide, Wallaroo, and Pirie, so the trouble is not so great as appears at first sight. Then, again, the quantity of wheat produced is said not to justify the cost. Even if such is the case, production is decidedly on the increase, and we can confidently look forward within a few years to having on an average 20 to 30 million bushels for export. Another is that the shipping companies do not at present cater for bulk transport; but no doubt if the change were made they would quickly accommodate themselves to it, for the shipping companies generally favor the bulk handling, as it is quicker to load and unload, and less space is taken up by the cargo. Then, again, it is said that insurance on bulk cargoes would be hard to obtain, as the Underwriters' Association are opposed to the system. On a trial shipment from New South Wales some few years back no difficulty in this way was experienced as far as I can ascertain, and doubtless if the bulk system were adopted the Underwriters' Association would conform to it, as the fact that over 80 per cent. of the wheat imported into the United Kingdom is in bulk goes to prove, not only the general acceptance of the system, but that the risk of loss is no greater. Doubtless there are other difficulties, but they are more apparent than real. One thing is certain, I consider, and that is the opposition of the merchants and millers. When we consider that at present the traders fix the standard, fix the general level of prices in the country, determine the practice in relation to the purchase of wheat below and above the standard, determine the bag system (excepting the size), and also the conditions for storage, can we wonder if they see strong reasons for retaining the present system? Under the bulk system practically all these powers would be taken from them, and they would be placed on the same level as the farmers, and have to conform to the system, whereas at present the farmers have to conform to a system created and worked by them. The difference is great, and not likely to appeal to them; but the farmers have the numbers, and if they will, they can make the way. Now for some of the advantages of the bulk system. The first of these is the saving in cost of bags, which would perhaps be hardly noticeable for a year or two, but which would eventually be great. It makes grading possible, and instead of as at present only one standard, several grades could be recognised, both at home and for export, as is done in other countries, encouraging the farmer to grow better wheat and clean it better, and place each district on its right level. At present the districts which grow the better quality have their profits reduced to make up for the less favored. This also applies to the individual farmer. The cleaning of the wheat, which would be done in the elevators, would be a decided advantage, as the export of a purer sample would tend to create a better demand, and hence a better price; for at present it is estimated that South Australia exports 15,000 tons of rubbish in the wheat annually, which cannot be welcomed by the millers, although they are able to save themselves by grinding same and selling as pollard and bran. Nevertheless, a pure sample of wheat up to a certain grade must be more acceptable and worth more. There is also the reduction in manual labor, minimising the cost of handling. The difference would be much on the same scale as the difference between filling and handling a hundred-gallon tank with water, and filling, corking, and handling 100 gallon bottles. Then comes the question of weighing. Under the bag system each bag is weighed, and each time the buyer gets the advantage of the draft, whilst wheat in bulk is automatically weighed in 2-ton lots. The weighing question appears to be one of the chief objections of the English merchant against bulk, for although the draft is very small, when there are thousands of bags in question it mounts up considerably. Another consideration is damage by weather. Further, it would overcome very much of the present risk from reaping damp or underripe wheat with the harvesters, in that on being received at the elevators it would all be cleaned again. What is perhaps of most importance to the farmer is the question of storage. At present the farmer delivers his wheat to the merchant, and if he does not wish to sell, he receives his cartnote, and the merchant has his wheat to trade on. When the farmer wishes to sell, he has to take what the merchant offers, or receive an equal amount of grain at considerable expense to himself. Under the bulk system the farmer delivers his wheat at the elevator; it is cleaned and graded, and he receives a certificate which he can operate on as a credit note if he wishes. When he desires to sell, he is in a position to make the best possible terms with the merchants. It has been stated that bagged wheat brings 3s. per quarter more than bulk in London, and that an extra 2s. 6d. per ton freight and 1½ per cent. insurance would be incurred on bulk grain. The weight of evidence is decidedly against this. Even if Australian bagged wheat brings 3s. per quarter more than Argentine bulk, that does not prove anything, for the fact is, as related by one of the New South Wales leading millers who has lately returned from a business trip to England, that the quality of Australian wheat makes it very desirable for mixing with other wheats, thus increasing the demand for it. It is really worth more. There is no reason to believe that Australian bulk wheat would realise less than bagged, especially considering that it would be a much cleaner sample and therefore more valuable. Whatever can be said to support the above statements, it is very certain that the handling charges are considerably less, which would, together with the saving of bags, probably more than cover the difference if the statements quoted were proved to be true. It has been questioned whether wheat in bulk can be exported owing to the great distance to the oversea markets, but some years back a trial shipment sent from New South Wales by way of the Cape of Good Hope, was received in England in splendid condition, and realised practically the same as bagged wheat. Bulk handling is not unknown to Australia, for in New South Wales several milling firms have erected elevators for their own use, and as an instance of the minimising of labor under this system, in one of these elevators 13,680 bags were received by 12 men in one day. Receiving includes weighing and cleaning. Now to consider briefly the outline of a scheme for initiating the system in this State. In the first place attention must be given to the three ports (Adelaide, Wallaroo, and Pirie) by the erection there of what are known as terminal elevators, which would, for some time to come, be ample, as wheat could still be bagged, carried by rail as now, and when emptied into the elevators, returned to the farmers, as is done in some parts of America still. The bags, well cared for, would in this way last for several seasons. As this arrangement might lead to confusion, and the mixing up of different farmers' bags, a better system would be for the bags to be loaned to the farmers from the elevators from year to year as required, as is also done in America to a certain extent, and in England by the elevator companies to millers in the country to carry the grain which is received in bulk to their various mills, no facilities for carrying grain in bulk being provided by the English railway companies. As time went on the system could be further extended by providing elevators at the lesser ports, and by the Railways Department gradually and systematically replacing the present trucks by one suitable for the carriage of grain in bulk, which would at the same time be as useful for the carriage of other goods. Receiving elevators could then be erected at the country centres, preference being given to the places from which the greater quantities of grain were railed. This could be gradually extended until we would have the complete system, which would be permanent and far more economical than the present. The farmers would accommodate themselves to the new order by providing box wagons, facilities at home for the storage of grain in bulk, &c., thus practically doing away with bags altogether and effecting a great saving in cost. I have refrained from referring to the probable cost of initiation, for the fact that such information as is available is naturally conflicting to a layman, the difference in the material used being such an important factor of cost, and also that my object is not to urge the immediate undertaking of so great a scheme, but rather to impress on members the need of a better system than we have at present, and throw a little light on the system of bulk handling. Let me say, in conclusion, that it must look almost ridiculous to those on the other side of the world who see how very particular we are in classing our wool and grading our butter, apples, eggs, honey, &c., and yet we still continue to handle and market our wheat—which is Australia's second greatest source of wealth—in a most slipshod, rough and tumble fashion."

The Hon. T. Pascoe, M.L.C. (Minister of Agriculture) said that as this subject was mentioned at the Congress held in September last, he immediately set about making inquiries with the idea of seeing whether the Government could be helped in some way in coming to a conclusion on the matter. In a previous paper on the subject Mr. Lock had stated, perhaps a little more definitely than he had in his paper this day, that New South Wales had obtained an independent report from an outside gentleman on the matter. The gentleman who reported to the New South Wales Government, Mr. Burrell, was a member of a firm that supplied elevators. The trial shipment made from that State was really no test as to whether wheat in bulk cargoes will carry safely to Europe, because there were 1,000 tons of wheat in bulk in a ship carrying about 10,000 tons of cargo. The result of the sale of the bulk sample, so far as the information was available, was that the bulk sample averaged 3d. per quarter less than the bagged. He had had a report on the question prepared, and this read :—In dealing with the question of the adoption of the American system of handling wheat in bulk, one has to consider whether it is possible to adopt the system in its entirety or to modify it to suit local conditions. Under the American method most of the crop is harvested with the binder and threshed by steam or other power, the grain going direct from the thresher into small farm elevators or into box wagons which convey it to the country elevator or to the railway truck. Under local conditions this is impracticable. While modifications and improvements in our havesting methods will undoubtedly be effected, the principle of harvesting the wheat as rapidly as possible at least expense and with a minimum of labor will hold good for the bulk of our crop for many years. It follows, therefore, that if the system of bulk handling is adopted it must be modified to suit local conditions, and that it will not entirely obviate the use of sacks. Recently a Victorian Royal Commission furnished a lengthy report on this question, while in New South Wales Mr. Burrell, one of the principals of a large elevator construction firm, was engaged to investigate and report on this subject. The Victorian Commission unanimously recommends the bulk handling of wheat on the grounds of economy and efficiency, and for the benefit of the State generally. To start with, a system of storing partly in bulk and partly in bags at country stations, conveying the wheat in bulk to port of shipment and there bagging it for shipment, is recommended. Mr. Burrell recommends the adoption of bulk handling in New South Wales, carrying the wheat in bags to the terminal elevator until such time as country elevators can be established and proper covered trucks provided for carrying wheat in bulk. The Victorian Commission suggests that terminal elevators be erected at Williamstown and Geelong with a total holding capacity of 4,000,000bush., and later Portland, and country elevators at 194 centres, with a total capacity of 10,000,000bush., a gross total of 14,000,000bush. The cost of this provision is set down at £1,206,753, while the cost of alterations to present type of trucks to make them fit for carriage of wheat in bulk is set down at £95,435, or a gross total of £1,302,188. If covered trucks are used the cost would be £1,544,253. This elevator provision for only 10,000,000bush. at one time in the country districts, out of a total crop of 30,000,000bush. to 36,000,000bush., appears under the conditions prevailing in South Australia to be inadequate owing to the fact that all this wheat is reaped within a short period, and only a small portion is shipped during that period. Under this proposal the farmer would probably bring his wheat in tied bags to the country elevator, or railway truck or shed where there is no elevator. As the farmer must be prepared to go straight ahead with his reaping so long as the weather and crop are favorable he must make bag provision for at least 75 per cent. of his crop. As tied bags would not hold within 10 per cent. of sewn bags he would therefore require approximately 84 per cent. of the bags he now uses, even if the elevator capacity were sufficient to deal with the wheat as rapidly as it reached the station. These bags, under the best conditions, would not be safe to use after the second year, and even then special receptacles would be needed to store them to prevent injury by mice, &c. Each year, therefore, the minimum cost for bags would be 42 per cent. of the cost under the present system. On a 24,000,000bush. crop the cost of bags at 6s. per dozen would be £200,000, but the farmer receives back approximately £50,000 in selling bags as wheat; the net cost, therefore, is £150,000. Under the system recommended by the Victorian Commission the cost for bags would be 42 per cent. of £200,000—£84,000, or £66,000 less than under the present system. This equals an annual charge of ·8d. per bushel for the use of the bags.

The Victorian Commission estimate the cost of loading in and out of trucks and sheds and into vessels under the present bag system at 2·98d. per bushel. Under the complete elevator system with bulk shipment by steamers specially fitted for the trade the cost would be 1·90d. per bushel; if bagged for shipment 3·93d. a bushel; under the scheme proposed involving shed accommodation for portion of wheat bagged, 3·37d. a bushel. No storage beyond two weeks is provided for in these figures. Although the report states explicitly that the estimate of 2·98d. per bushel under the bag system is for handling alone (page 67), figures elsewhere (appendix, page xxiii.), show that this cost includes cost of bag, which is equal to 1½d. per bushel net. Under the system recommended it would be necessary to provide for the cost of conveying the wheat in bags from field to elevator as under:—Use of bag, ·8d. per bushel; unloading and emptying bags into bin or truck, and looking after bags, say

·1d. per bushel; total, ·9d. per bushel. If these figures are added to the estimated cost of the complete elevator system with bulk shipment it shows a total of 2·80d. per bushel, against 2·98d. under the bag system. While, as will be shown later, the cost of the elevator system is probably too low, the handling cost of wheat in bags is not under-estimated. In South Australia lumping is done at piecework at 1s. 1d. per ton of 12 bags in and out of stack. A certain portion is loaded direct to truck and goes direct to the ship's side, in which case the total cost is about 1s. per ton. Where the wheat has to be wheeled or carried from truck across wharf to the ship the cost is approximately 7d. per ton. The practice is to avoid extra handling as far as possible, and when all these points are considered it is fair to assume that the cost averages nearer 1½d. per bag than 2d.

New South Wales.

Mr. Burrell, the American expert, in his report to the New South Wales Government, recommends terminal elevators at Sydney and Newcastle, the construction of covered box-cars, and also the erection of 25 country elevators. The total capacity of these elevators is, however, only 4,500,000bush., and he suggests that the Farmers' Co-operative Associations should erect their own country elevators. The capital cost of the proposed scheme is £854,000, compared with the Victorian estimate of about £1,250,000 for over three times that amount of storage. The Sydney terminal elevator, to hold one and a half million bushels, is estimated to cost £163,000, against the Geelong terminal elevator to hold one and a quarter million bushels at a cost of £124,700. Mr. Burrell's estimate for country elevators to hold 100,000bush. and 50,000bush. is £13,400 and £7,800 respectively, against the Victorian cost of £4,500 for a 60,000bush. elevator. It will be seen that the capital outlay per 10,000bush. in large elevators is £1,080·66 in New South Wales, and in Victoria £997·6; for the country elevators the costs are £1,560 and £750 respectively. Mr. Burrell recommends as a start that the terminal elevators be erected and the wheat sent to them in bags, to save loss on bags shipped, which he put at £160,000. As the farmer will need a full number of bags, which will only last two years, the supposed saving is reduced at once to £80,000; then, as the farmers get the equivalent of 1½d. a bag in the sale of their wheat, this must be further reduced to from £40,000 to £50,000. Mr. Burrell does not enter into much detail as to cost of handling from start to finish, but puts the cost at a country elevator handling 400,000bush. at ·4d. per bushel, and at terminal at ·25d. per bushel; but it is not clear whether this includes loading into the ship, interest on capital, &c., as given in the Victorian estimate of 1·90d. per bushel. Mr. Burrell's recommendation appears to be based almost entirely upon losses sustained in the present system of bagging and the saving of cost of handling bags, and he quotes the following figures of costs and losses on 1,000 bags of wheat:—(*a*) Damage from damp ground when stacked in field, £1 5s.; (*b*) loading and unloading at railway station, £4 10s.; (*c*) damage from weather at railway station, £5; (*d*) rebagging at railway station, 10s.; (*e*) handling and power at Darling Harbor, £4 13s.; (*f*) waste from bags, £4 17s. 6d.; (*g*) bags, £29 1s.; (*h*) covering stacks and railway wagons, 12s.; or a total of a little over 4d. per bushel, against a cost of ·65d. per bushel (?) for handling in bulk at country and terminal elevators.

These figures, however, are open to serious criticism. (*a*) Damage in the field will be no less where the wheat is bagged from the harvester and carted to the country elevator. (*b*) There will be some expense for unloading, opening, and emptying bags into the elevator or truck. (*c*) Damage from weather is excessive in comparision with local experience, amounting to approximately the loss of 10 bags in 1,000 (1 per cent.). Mr. Miller (of the South Australian Farmers' Union) stated in Parliament that two years ago, when losses were above the average, the Union, on the handling of 3,500,000bush., lost in actual weight 11,000bush., or about ·3 per cent. In the average of years it is very doubtful whether the loss equals ·1 per cent., against Mr. Burrell's allowance of 1 per cent. (*d* and *e*) Comparison is difficult, but the cost per ton from shed or truck to ship under South Australian conditions would not be more than 6d. or 7d. per ton; Darling Harbor charges are apparently 1s. 1d. in and out. (*f*) This waste from bags is again nearly 1 per cent., surely an excessive figure. (*g*) Bags—as previously shown, even under the elevator system, the farmer would still be at an expense of about ·8d. per bushel with the complete elevator system, and over 1d. under a system by which there are elevators only at the principal stations.

Taking these figures together it appears that under South Australian conditions the estimated cost under the bag system should be reduced to about 3d. per bushel, and the cost under the elevator system increased by 1½d. to 1¾d. per bushel. It may be noted here, however, that the Victorian costs of working the country and terminal elevators is 1·90d. against Mr. Burrell's ½d. In America the charge for this work (including cleaning) is ⅞d. at country and ⅜d. at terminal elevators (storage for 15 days and insurance included), or a total of 1¼d. per bushel. A partial adoption of the elevator system will cost more than the present bag system, apart altogether from the question as to whether wheat in 3-bush. bags will realise more than bulk wheat. It is admitted that in the old 4-bush. bag this was the case. The whole advantage of the elevator system appears, then, to be (1) in the saving of waste—and it is extremely difficult to say what this amounts to; and (2) in relieving the farmer from alleged disabilities imposed by the wheat buyers.

Certain aspects have not been touched on in arriving at these alleged savings in cost set out in either proposal. (1) There will only be a partial saving in handling and losses unless there are elevators at every station or sufficient trucks to enable the farmer to empty his bags without delay. (2) In neither scheme does sufficient elevator provision appear to have been made to handle the wheat in the short period in which it must be handled if there is to be so much economy in bags and handling. To deal with the wheat as it arrives, it is more than probable that the elevator capacity required would need to be one-half—certainly not less than one-third—of the wheat received. The Victorian Commission's report (page 12) shows that the maximum quantity in storage at any one week in the different districts varied from 25 per cent. to 52 per cent. of the total aggregate received for the season. Of the total quantity of 26,000,000bush. received at railway stations in 1910-11 during 10 consecutive weeks the quantity of wheat stored at country railway stations exceeded 33 per cent. of this aggregate (Appendix 7, page xxx). (3) The Victorian figures of cost of handling in bulk are based on shipment in steamers specially equipped for handling wheat in bulk. It is not shown that the freight in such steamers would be the same as for bagged wheat. For sailer shipment it is admitted that the handling cost per bushel would be over ½d. per bushel more than quoted, *i.e.*, 2·42d. against 1·90d. (4) Our wheats are used chiefly for mixing with other wheat for milling, and when bagged can be handled in large or small lots at any port. This could not be the case with bulk wheat without added cost in many instances.

COST TO SOUTH AUSTRALIA.

It is difficult to even suggest with any claim for accuracy what elevator provision would be found necessary under actual working conditions, as the rapidity with which the wheat crop is handled depends upon—(1) the amount of the crop; (2) the ruling prices for wheat, and consequently, whether farmers sell or hold their wheat; and (3) the freights available. Taking the Victorian basis (of working an elevator capacity of approximately one-third of the quantity of wheat actually received at the railway station), provision would be necessary for—terminal elevators, capacity of 2,000,000bush.; country elevators, capacity of 6,000,000bush. Total, 8,000,000bush. This would cost for the elevators and necessary machinery (according to Mr. Burrell's estimates) approximately £1,059,000. That the provision of 6,000,000bush. country storage and 2,000,000 terminal is the minimum, even with present area under crop, is shown by the following facts:—(1) During 1911, for a period of about 15 weeks, the quantity of wheat stacked at railway stations and railway ports, not including Port Adelaide, exceeded 6,000,000bush., and for four weeks exceeded 9,000,000bush. (2) Of the total quantity of wheat shipped oversea as wheat the quantity not shipped by February 1st, in 1911, 1912, and 1913 varied from 11,500,000bush. to 16,000,000bush; and quantities not shipped by April 1st, from 7,000,000bush. to 14,000,000bush. Storage for all this, in addition to local and export requirements for flour, would require to be provided for, unless the wheat was shipped much more rapidly than it has been in the past. This does not include any provision at country stations receiving less than 20,000bush. in either 1911-12 or 1912-13.

It must also be remembered that wheat must be handled in bags at all our shallow-water ports, or ports where the oversea ship anchors some distance from the jetties, or where the business does not warrant an elevator.

The following figures, supplied by the Marine Board, show the quantities of wheat shipped from the various ports under the Board's control where the elevator could not be used economically :—

Port.	Shipped— January-July, 1913. Bushels.	Stored— July 31, 1913. Bushels.
Kingscote	675	—
Hog Bay	75	—
Edithburgh	12,684	—
Elliston	94,038	—
Franklin Harbor	282,000	—
Germein	103,275	10,926
Tumby	14,019	—
Arno	189,099	—
Price	145,341	56,100
Port Kenny	—	47,775
Venus	47,769	7,128
Neill	66.798	831
Scales	72,096	23,667
Lincoln	12.900	90,000
Victoria	290,673	33,000
Fowler's Bay	80,529	—
Smoky Bay	24.084	—
Le Hunte	70,821	921
Laura Bay	15.582	18,423
Broughton	215,190	24,000
North Shields	9,426	—
Wakefield	326,820	39,900
Lipson Cove	7,476	—
Streaky Bay	119.667	13.998
Carawa	46.008	1,044
Denial Bay	146,409	—
Murat	121 029	13,140
Shipped	2,514,483	380,853
Stored	380,853	
Total	2,895.336	

In trying to arrive at the cost per bushel for handling wheat in bulk under South Australian conditions it must be borne in mind that out of a total crop of 24,000,000bush., between 3,000,000bush. and 4,000,000bush. are retained on the farm for seed and feed purposes, and say 3,000,000bush. are handled at shallow-water ports where elevators cannot be used. It follows, therefore, that interest, depreciation, and working expenses will form a charge on 17,000,000bush. Some of this will be handled more than once, but as this cannot possibly be estimated it must be ignored.

The following figures show what these charges would amount to (based on Victorian estimates) :—Interest at 4 per cent. on £1,059,000, £42,360 ; depre ciation and maintenance of buildings at 2½ per cent., £12,500; depreciation and maintenance of machinery at 8½ per cent., £47,515; total, £102,375; equal to 1·44d. per bushel. The Victorian estimates of working expenses (labor and fuel) based on the assumption that the country elevators will handle three times their total capacity each season, varies from ·5d. per bushel to ·9d.; in addition the working expenses of the terminal elevators, on the assumption that a 1,000,000bush. elevator will treat 6,000,000bush. during the year, came to ·14d. per bushel. Assuming that the actual working expenses at both country and terminal elevator will average ·75d. per bushel, we have the following figures as the cost per bushel of bulk handling under South Australian conditions:—Use of bags, ·9d.; interest, depreciation, and maintenance, 1·44d.; working expenses, ·75d.; inspection, weighing, and trimming cargo, ·15d. (Victorian estimate); total, 3·24d. Against this the present cost of shipping in bags (Victorian estimate):—Bags at 6d., 2d. per bushel; stacking in shed at 1d. bag, ·33d. per bushel; out of shed at ½d. per bag, ·17d. per bushel; local agent's charges, ·50d. per bushel; weighing, ·01d. per bushel; stevedoring at 1s. 6d. per ton, ·50d. per bushel; total, 3·51d.; less value of bag sold as wheat, ·53d.; net cost, 2·98d. per bushel.

On these figures bulk handling is, under local conditions, directly more costly than bag handling. It must be pointed out that in the Victorian estimate of 1·90d. per bushel for bulk handling, country and terminal elevator charges amount to 1·75d. per bushel, whereas in this estimate they total 2·19d., due to difference in cost of elevators, and further the Victorian estimate makes no provision for cost of bags which the farmers must use. In the circumstances it would appear that whatever the indirect advantages to be derived from the adoption of bulk handling in South Australia, there would be an added cost of approximately ·26d. per bushel in the 17,000,000 bush. handled by the elevators.

Mr. H. G. Hawkins (Port Pirie) said apparently previous speakers on this subject had based all their calculations on shipment to the United Kingdom. A large business in wheat was done with South Africa and South America. which places had no facilities for bulk handling. Nothing but wheat in sound sacks would be accepted there. South America would not accept wheat from the United States, because it was in bulk or in hessian bags. He read the following extract of a letter from Messrs. Berry, Barclay, and Co., of 15, Leadenhall Street, London, E.C.:—

> SHIPMENT IN BULK.—This is a question which seems to arise whenever bags are dear, and shippers seem to lose sight of the fact that the buyers also take this question into consideration, and would not be able to pay so much for the wheat if the bags were not included.
>
> The chief objection to shipping in bulk is that the cargo would be much more liable to shift in a storm, and the dangers of the voyage would be increased, so that the rates of insurance would be greatly enhanced. An attempt was made some years ago to ship parcels by general cargo steamers provided with separate bins, but this was not repeated because, although the wheat travelled fairly well, the lower prices obtainable for it took away the anticipated profit.

The bags are of great advantage when the wheat has to be transhipped into other vessels, or forwarded by rail, as frequently happens, and in those ports where elevators are employed, the wheat can be easily shot down and worked through the elevators.

After considering the matter thoroughly we have come to the conclusion that the plan of shipping in bulk would not be feasible from Australia. It would upset the present system of shipping and handling on the farms, as well as on the railways, and we think the disadvantages we have named would greatly outweigh any benefit that might be gained by it.

Our friends, the Yankees, are generally fully alive to their own interests and have no doubt considered the question in all its bearings. They ship their red wheat, which is harder, and comes by steamers in seven or 14 days across the Atlantic in bulk; but their white wheat from California, Oregon, &c., which is brought mostly by sailing vessels on the three or four months' voyage from the Pacific round Cape Horn, is invariably shipped in bags.

Mr. F. Coleman (Advisory Board) said his opinion on this question had been very much strengthened by the report read by the Hon. Minister. It would be wise for this State to wait and see the result of the action of New South Wales. Conditions were more favorable in that State. With regard to the question of grading, he said Australian wheat was valued higher than any other on the English market. It was a fact, nevertheless, that they were sending home a great deal of grain of which they should be ashamed. He had used the harvester, and in his opinion this machine had come to stay. From Cardiff came a complaint that the wheat from Australia was smelling of eucalyptus and lavender. The elevator system would enable them to clean and grade their wheat. Australian wheat was too thin in the skin to stand the handling that it would receive in bulk, according to the statement of a leading English miller. He urged farmers to send out their wheat in the best possible condition.

Mr. W. F. Nicholls (Narridy) had noticed a tendency in South Australia to underrate the quality of the wheat produced in that State. They should not decry that article which they had to market. Merchants should take a stand against the practice of farmers rushing their wheat into the stacks so soon as a damp day was experienced during harvesting.

Mr. E. J. Pearce (Whyte-Yarcowie), who had read Mr. Lock's paper in the writer's absence, thanked the Conference for the manner in which it had discussed the subject. In Canada, they had portable granaries which they used to transport the grain from the harvesters to the elevators. He thought that not more than 50 per cent. of the bags at present in use would be required if the system were introduced. In shallow ports they could use floating elevators to take the grain to the deep-sea boats.

EVENING SESSION.

NEXT CONFERENCE.

After a lengthy and animated discussion, it was decided that the next conference should be held at Crystal Brook.

SHEEP AND FORAGE CROPS.

At the Agricultural Bureau Conference held at Saddleworth last year, the Director of Agriculture dealt with the subject "Sheep and Fat Lambs." In continuation of this subject, this year he spoke on the growth of fodder crops for feeding off with sheep.

LIME.

At the outset, he mentioned that he had been requested to deal with the subject of lime; but he explained that, although the practice of using lime in many parts of South Australia was one to which the farmers could scarcely give too much attention, in the Northern Areas the pressure did not obtain. It was characteristic of the class of country with a rainfall of from 13in. to 20in. that the elements in the soil which were most likely to be lost were not leached out, and the percentage of ingredients such as lime was always high. Except possibly on the excessively stiff claypans, they would scarcely see any advantage from an application, and it certainly would not repay the expenditure.

GROWING CROPS FOR STOCK.

The greatest development in agricultural practice that could be made at the moment, and the most profitable, was the better management of sheep on the farms. Farmers had grown so accustomed to pay their whole attention to wheat that the other factors which made for the wealth of the output were to a large extent lost sight of. He did not advocate that less attention should be devoted to that product for which those regions were so admirably adapted, but was convinced that if they gave more attention to sheep they would grow better crops of wheat, and, although the area might be a little reduced, the total output would be greater. There was a monotony about the continuous fallow and wheat, fallow and wheat. If they grew wheat, however, and kept stock, and tried to excel with that stock, there would be no desire on the part of the farmer to retire—it would be impossible to drag him off the farm.

MIXING THE BREEDS.

In the matter of horses, they would find uninformed men mixing Shire and Clydesdales, without any qualms of conscience whatever, and taking up positions as breeders. If the men would work up a knowledge of the biology of stock and the principles of heredity, they would never mix up two breeds like that. If the one breed did not meet their demands, in weight, or something else, they would bring about the improvement from within the breed itself. They would not find sheep men who were properly informed putting the Lincoln on to first-class Merinos with the idea of getting a longer staple. They would never get it. Mendelism had shown that the correlation of these different characters was such that they could not separate the dominant and the recessive. In his opinion, when they were dealing with the stock they had to go back to the traditions of breeding, and work by that knowledge.

WHEAT AND SHEEP.

With the idea of demonstrating the results likely to be secured from the judicious use of sheep on the wheat farm, he took as an instance a 640-acre holding; 300 acres of this would be under wheat and 300 under fallow, if it were to be worked on the prevailing wheat-and-fallow system. At 3s. 4d. a bushel, a 21-bush. harvest would return £910, representing a net return, after seed, &c., had been taken out, of £820. The alternative system which he proposed would mean that there were 200 acres of crop, 200 acres of fallow, and 200 acres of stubble-growing. Probably the figures would be challenged if he were to give a bigger average for the 200 acres, but if he took it at 21bush. it would return, less the amount retained for seed, £571. That left £288 to be made up. With a large proportion of the land represented at that conference, the 200 acres left out would each carry a ewe and a lamb. With the little picking to be obtained from the fallow before it was ploughed, and the run on the stubble and the fallow, it would carry 280 or 300 sheep. A sheep of the proper type, well managed on the farm, was worth £1. They had then the lamb and the fleece. Taking it at 16s. 8d. he was well within the mark. The deficit on the wheat cheque from the 200 acres, compared with the 300 acres, was £288. The 280 sheep at 16s. 8d. would return £233, which brought the difference to £55. If there were a man in the room who could put in 100 acres of wheat with manure, and take it off, and buy the bags, and deliver it to the station for £55, he could teach them something.

GRAZING VALUES.

Most of those who were putting in the smaller area, however, were not getting the best of the sheep. There was an extensive area on which the rainfall averaged from 18in. to 25in., and where to have one-third of the farm under fallow was not the game. To some extent this was much more difficult to oppose than the ordinary wheat and fallow practice. In the higher rainfall district they could secure the fallow results, and at the same time get something more from the land than bare fallow. If they worked it up in the autumn and put in a fodder crop the following wheat crop would not suffer. The thoroughness of the fallowing on the three years' system left the grazing of less value, because few weeds remained. It was said that the harvester returned the weed seeds, but the fire was run over the stubble. This system was good, but they could go further. They could grow forage crops. Those with the lighter rainfall might work out the problem for themselves whether they could not put a portion of the fallow in with a forage crop to be grazed down with sheep, and throwing the rotation on that part out a year.

VARIOUS FORAGE CROPS.

The crops in the public attention at present were peas, rape, mustard, Italian rye grass, and vetches. Peas were not ascendant. If they tried the others in the normal season, they would very likely find that peas did not work out the most profitable. They should get this crop right round the farm in a cycle of a few years. Under similar conditions, in a season when the weather broke at the end of March or the beginning of April, they would find that rape, with a little mustard mixed, or barley, would produce more feed than peas.

The average carrying capacity for the last three years, of 2-acre blocks of land ploughed up and sown to Italian rye grass at Aldinga had been 10·6 sheep for five months. Of course, if the sheep had been put in for five months continuously the land would not have carried that number. A larger number had been put in for a short period, and when they had eaten the feed down they were put on to the next plot. It was in this respect that rape and rye grass gained an advantage, because while the other plots were being fed off, they were gathering strength. Oats had during the same period averaged 10·5 sheep; peas, 7·82; mustard and rape, 11·13; and barley, 10·36. The year just passed was very bad for peas, and thus had brought down the average.

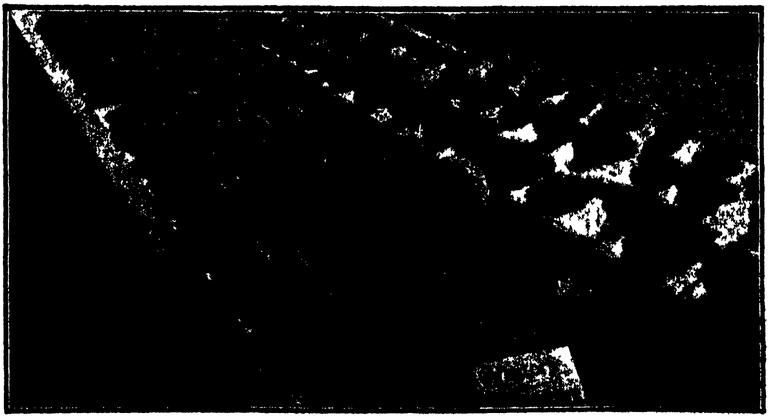
If they were able to get 3s. 4d. to 4s. for fattening a sheep, and could fatten that number, there was money in it. If they cared, they could increase the number of ewes, and fatten the lambs. When they were using manure on the wheat crop, they could spare a little to top-dress the grass land. The result would be astonishing. At Aldinga, natural grass dressed with 1½cwts. of manure had carried up to 10·8 sheep for five months. It was not fed continuously, and this was a point that had yet to be learned. It was essential to take out the sheep from time to time, to allow the field to become sweetened. Farmers should keep a bigger strength of horses. Under present conditions, they could not find time to put in the forage crops properly. To do this it might be necessary for them to keep two or three more horses than they would otherwise have. These should be brood mares. They could be worked at that time, and would not be wanted during the harvest, when they had foals at foot. They would earn their keep by getting a 20-acre or 30-acre crop put in well.

INFERIOR LAMBS.

At the slaughter-yards they could see thousands of lambs in a hard and unfinished condition. These returned from 11s. 6d. to 13s. If the growers had had forage crops on which to wean the animals the price would have been from 17s. to 19s. With a heavy rain in March, they should work the hay stubble well, and put on 1cwt. or 2cwts. of manure, and sow with 4lbs. or 5lbs. of rape, and 2lbs. or 3lbs. of white mustard, or some barley. If they got it in before the moisture was out of the land, they would fatten 10 or 14 sheep to the acre on it. This had been done at Aldinga in a dry year. They had the choice of rape, peas, Italian rye grass, oats (not Algerian), and barley (*i.e.*, the better type of six-row). If the latter were put in at the rate of 2bush. to the acre, it would be up a long way ahead of the grass, and this could be spared and allowed to gather strength. If one-twelfth of the area under fallow within the country represented at that conference in a normal year were thoroughly put under rape, given that one-third of the farm was out in stubble or herbage, they would be able to fatten half a million lambs.

ODDS AND ENDS.

In reply to questions, the Director said peas and vetches encouraged weeds, and the fallow crop was handicapped in that way. If the peas were put on fairly clean land, the wheat could be sown immediately following. Early Dun peas were the best. The Partridge variety would give a better wealth of feed, but it was later. He had had no experience with silver beet as a fodder, and would hesitate to expect a fraction of the results that had been obtained with it in New Zealand. He was sorry they were discarding the old strongly-built scarifier that was in favor 20 years ago. He did not see any advantage in use of super. at the time of fallowing as well as at sowing. If they applied it early in the season while the moisture was there they might get increased ferment activity, but the man who was using sufficient phosphatic manure would have the benefit of the reserve from the previous crop. It was practically impossible to leach phosphate out of the land. On the average the best time to feed off peas was when they had ripened and had been allowed to lie. When there was a good demand for lambs, and the lambs were well forward, and the peas were beginning to pod, there might be an advantage in feeding them off. However, when caterpillars appeared, the peas should be fed off at once. In the districts with a heavy rainfall—18in. to 20in.—they would find it an advantage to increase the quantity of seed to 2bush. of peas.



Fruit Exhibit, Adelaide Show.

THE WHEAT MARKET.

Commenting on the wheat position in England, *Beerbohm's Evening Corn Trade List* of January 23rd states :—" The world's shipments to all destinations last week were on an immense scale for the time of year, amounting to no less than 2,020,000qrs., of which North America contributed 990,000qrs. and Australia 375,000qrs. This is easily a record for January, the previous largest total being for the week ending January 30th last year, when the shipments amounted to 1,740,000qrs. The proportion to Europe last week was 1,840,000qrs., including 900,000qrs. for the United Kingdom and 'orders.' This shipment is all the more exceptional insomuch that India shipped practically nothing. Argentina has hardly commenced moving her new crop, and the recent holidays in Russia interfered with exports from that country. It is very improbable that, for a long time to come, North America will again give us such a large quantity as was shipped last week, but the movement is expected to continue on a fairly liberal scale, and, with Australia exporting freely, a moderate increase in shipments from Argentina, and fair quantities from Russia and the Danube, the weekly total promises to be fully equal to requirements. This week's total, however, promises to be quite a moderate one.

" Imports into the United Kingdom last week were quite small, so that, notwithstanding considerable deliveries of English wheat, the total supply was 65,000qrs. below the estimated requirements. Arrivals on the Continent were also quite moderate, and, as a result of the heavy exports, the quantity afloat increased by 790,000qrs. The United Kingdom imports promise to be fairly liberal in the next fortnight, and stocks will probably increase slightly.

" The estimates cabled over from Australia vary considerably as to the probable quantity of wheat available for export this year, ranging from about the same as last year, viz., 6,535,000qrs. up to 8,000,000qrs. ; in 1912 the exports were 5,100,000qrs. Meanwhile the outward movement is in full swing, and exports will, no doubt, continue large during the next three months.

" If the final official estimate of the last Canadian crop be correct, viz., 29,000,000qrs., against 25,000.000qrs. in 1912, then the reserves left in farmers' hands, notwithstanding that to date they have delivered 3,000,000qrs. more than last year, are quite as large as a year ago. This does not agree with the reports cabled over from time to time during the past few weeks, to the effect that much less wheat was in farmers' hands than last year. The reasons given for the much larger movement from the farms to date are exceptionally favorable weather for moving the crop, better railway facilities. and the financial state of farmers. Time will prove whether this latest estimate is correct or not, but, considering that it is based on actual threshing results, it ought to be nearer the real quantity than the earlier estimates. Winter wheat in the United States is coming forward more freely, and these supplies are likely to increase so long as crop prospects are favorable ; any serious change in the crop outlook would, however, probably check the movement."

Date.	LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
Feb. 6	Dull; Jan.-Feb., 4/5⅛	3/6½ to 3/7 ..	3/6¼ to 3/6½ ..	3/6½
7	Firmly held; Feb.-March 4/5	Do. ..	Do. ..	Do.
9	—	Do ..	3/7 ..	3/6¾ to 3/7
10	Firm, improved demand; Jan.-Feb. 4/5⅛; Liverpool firm; Feb.-March 4/5⅝	Do ..	Do. ..	3/7
11	Steady, but quiet	Do. ..	Do. ..	Do.
12	Steady, but quiet; Liverpool quiet	Do. ..	3/7 to 3/7¼ ..	3/7 to 3/7¼
13	Quiet	3/6½ to 3/7 ..	3/7¼ ..	3/7¼
14	Steady, but quiet	Do. ..	Do. ..	Do.
16	—	3/7 ..	3/7½ to 3/7¾ ..	3/7½ to 3/7¾
17	Steady, but quiet	Do. ..	3/7¾ ..	3/7¾
18	Firm, sailers; Jan.-Feb. 4/5⅝; April-May 4/6; Liverpool firm, more inquiry	3/7 to 3/7½ ..	Do. ..	Do
19	Firm, held for 3d. advance; Liverpool firm, less active; sailer, Feb.-March 4/6; steamer, Feb.-March 4/5⅝	Do. ..	3/7¾ to 3/8 ..	3/7¾ to 3/8
20	Quiet; Liverpool firmly held, inactive	Do. ..	Do. ..	Do.
21	Steady, slightly firmer; Jan.-Feb. 4/6; Liverpool steady quiet	Do. ..	Do. ..	Do.
23	.. ..	3/7½ to 3/8 ..	3/8 to 3/8¼ ..	3/8 to 3/8¼
24	Firm, held for 3d. advance; Liverpool firm, 3d. to 6d. de arer	Do ..	Do. ..	Do.
25	Firm, more inquiry; Jan.-Feb. 4/6½; Feb.-March 4/6⅜ Liverpool firm, fair inquiry	Do. ..	Do. ..	Do
26	Firmly held at full rates; April-May 4/6¾	Do ..	Do. ..	Do.
27	Firm, Australian to arrive, 4/7¼; Liverpool firmly held at full rates	3/8 to 3/8½ ..	3/8¼ to 3/8½ ..	3/8½
28	—	Do. ..	Do. ..	Do.

Steamer Freights.—(March 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 25s. per ton (8d. per bushel); to South Africa, 22s. 6d. per ton (7⅓d. per bushel). Parcels, Port Adelaide to London-Liverpool, or Continent, 25s. per ton (8d. per bushel); Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel); to Sydney, 10s. 6d. per ton (3¼d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 25s. per ton (8d. per bushel); South Africa, 21s 3d. to 22s. 6d. per ton (6¾d. to 7⅓d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

The General Manager of the Produce Department reports on March 2nd—

Butter Factory.

Owing to the hot spells experienced during the month the supply of cream has been somewhat unsettled and is falling off gradually. In consequence the prices have been on the rising grade, the present prices being—superfine, 1s. 4d. per lb., and pure creamery, 1s. 3d. per lb.

A. W. Sandford & Co., Limited, reported on March 2nd—

Butter.—The extreme heat experienced during February has lessened quantities of butter considerably, so that heavy importations have been necessary to fill up the shortage, with values improving about 2d. since our last report, but this applies only to top qualities, second and third grades being slow of sale. Best factory and creamery, fresh in prints, realised 1s. 1d. to 1s. 4d. per pound; choice separators and dairies, 11d. to 1s.; store and collectors, 8d. to 9d.

Eggs have experienced a seasonable advance, the supplies arriving being large for the time of year. Hen are selling at 11d. per dozen; duck, 11½d.

Cheese is also showing a firming in price, owing to the heavy parcels exported relieving the market. Present quotations 6d. to 6½d. per pound for large to loaf.

Bacon continues to rule at high rates, and as the live hog has been very scarce there has been no difficulty in placing all consignments coming forward. Best factory-cured sides, 10d. to 11d. per pound; hams, 1s. to 1s. 1d. per pound; lard in skins, 8d.; bulk, 7d. per pound.

Honey is in good request, both for local and export, purchasers realising that the take is not as heavy as was first anticipated. Prime clear extracted samples, 3d. per pound; beeswax, 1s. 2d.

Almonds.—Small parcels of the new crop are now arriving, but quantities are not nearly equal to trade wants. Brandis, 6d.; mixed soft-shells, 5d. to 5½d.; hard-shells, 3d.; kernels, 1s. 2½d. per pound.

Live Poultry.—Good demand continues for poultry, especially where quality is right. However, there is still a large proportion of small and light birds, and such only find slow sale. Good table roosters realise 3s. to 3s. 6d. each; nice conditioned cockerels, 2s. to 2s. 6d. (small and light birds lower); ducks, 2s. to 2s. 6d.; geese, 3s. to 3s. 6d.; pigeons, 5½d.; turkeys from 9d. to 11½d. per pound live weight for fair to prime table birds.

Potatoes and Onions.—There has been an uninterrupted supply of potatoes from Mount Gambier and local sources, and values have not altered. As usually happens after a spell of dry weather, the grub pest has made its appearance in the ripened crops, and there has been some difficulty in getting samples reasonably free from damage. **Onions.**—Owing mainly to the operations of a few buyers for export this market has managed to hold its own, and as reports concerning the Victorian crops are not now so favorable, growers have a tendency to hold back supplies. Present prices—Potatoes, £4 2s. 6d. per ton on trucks, Mile End or Port Adelaide; 4s 6d. to 5s. per cwt. in the market. Onions.—£7 per ton on trucks, Mile End or Port Adelaide; 6s. 6d. to 7s. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of February, 1914, also the average precipitation to the end of February, and the average annual rainfall.

Station.	For Feb., 1914	To end Feb., 1914.	Av'ge. to end Feb.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.				
Oodnadatta	—	2·59	1·25	4·76
Tarcoola	—	—	0·67	7·58
Hergott	0·78	1·39	0·95	6·04
Farina	—	0·37	1·08	6·70
Leigh's Creek	—	0·35	1·18	8·66
Beltana	0·44	0·88	1·44	9·22
Blinman	0·42	1·00	1·89	12·85
Hookina	0·83	0·83	—	—
Hawker	0·18	0·46	1·01	12·22
Wilson	0·03	0·18	1·22	11·78
Gordon	—	0·21	0·85	10·26
Quorn	—	0·51	1·06	13·78
Port Augusta	0·05	0·31	1·00	9·46
Port Augusta W.	0·05	0·34	0·85	9·36
Bruce	—	0·73	0·85	10·01
Hammond	0·08	0·50	1·13	11·46
Wilmington	—	0·32	1·34	18·26
Willowie	—	0·41	0·85	11·90
Melrose	0·08	1·45	2·09	23·04
Booleroo Centre	0·03	0·47	1·33	15·83
Port Germein	0·05	0·30	1·08	12·84
Wirrabara	0·10	1·32	1·24	18·91
Appila	0·06	0·53	1·28	15·08
Cradock	0·03	0·41	1·22	10·86
Carrieton	0·14	0·52	1·23	12·22
Johnburg	0·15	1·14	0·96	10·21
Eurelia	—	0·22	1·22	13·24
Orroroo	—	0·64	1·59	13·42
Black Rock	—	0·77	1·21	12·25
Petersburg	0·83	1·51	1·31	13·07
Yongala	0·36	0·90	1·20	13·94
NORTH-EAST.				
Ucolta	0·06	0·12	—	—
Nackara	0·30	0·40	—	—
Yunta	0·05	0·11	1·15	8·22
Waukaringa	0·20	0·74	0·92	7·94
Mannahill	0·60	0·70	1·23	8·46
Cockburn	—	1·25	1·25	7·97
Broken Hill, NSW	0·03	0·40	1·60	9·63
LOWER NORTH.				
Port Pirie	0·06	0·26	1·02	13·21
Port Broughton	0·17	0·22	1·15	14·33
Bute	0·19	0·25	1·08	15·42
Laura	0·06	0·50	1·33	18·22
Caltowie	—	0·47	1·30	17·27
Jamestown	0·13	0·59	1·27	17·46
Gladstone	—	0·24	1·20	16·00
Crystal Brook	0·08	0·21	1·20	15·62
Georgetown	0·04	0·36	1·34	18·32
Narridy	0·10	0·16	1·17	16·79
Redhill	0·20	0·38	1·15	16·79
Spalding	0·11	0·38	1·27	20·25
LOWER NORTH—*continued.*				
Gulnare	0·10	0·27	1·22	19·74
Bundaleer W. Wks.	—	0·11	1·06	17·29
Yacka	0·18	0·31	1·07	15·27
Koolunga	0·23	0·42	1·27	15·94
Snowtown	0·12	0·12	1·09	15·70
Brinkworth	0·22	0·27	1·00	15·48
Blyth	0·12	0·14	1·26	16·34
Clare	0·13	0·37	1·66	24·30
Mintaro Central	0·11	0·17	1·25	21·99
Watervale	0·14	0·43	1·61	27·17
Auburn	0·18	0·44	1·83	24·25
Hoyleton	0·07	0·13	1·30	17·96
Balaklava	0·24	0·28	1·23	16·03
Port Wakefield	0·21	0·36	1·16	13·13
Terowie	0·19	0·68	1·47	13·71
Yarcowie	0·71	1·39	1·26	13·91
Hallett	0·21	1·01	1·32	16·40
Mount Bryan	0·28	1·03	1·22	15·73
Burra	0·38	0·57	1·45	17·82
Farrell's Flat	0·24	0·34	1·44	18·87
WEST OF MURRAY RANGE.				
Manoora	0·13	0·50	1·09	18·09
Saddleworth	0·32	0·72	1·46	19·69
Marrabel	0·96	1·49	1·23	18·94
Riverton	0·40	0·72	1·32	20·48
Tarlee	0·72	1·79	1·33	17·48
Stockport	0·52	1·50	1·23	15·89
Hamley Bridge	0·16	1·07	1·34	16·45
Kapunda	1·69	3·24	1·48	19·67
Freeling	0·55	0·91	1·33	17·85
Greenock	0·88	1·46	1·38	21·46
Truro	0·50	1·69	1·28	19·74
Stockwell	0·56	1·33	1·31	20·30
Nuriootpa	0·44	1·24	1·34	21·25
Angaston	0·38	1·20	1·30	22·25
Tanunda	0·44	1·42	1·44	22·28
Lyndoch	0·42	0·95	1·31	23·01
ADELAIDE PLAINS.				
Mallala	0·23	0·80	1·27	16·88
Roseworthy	0·94	1·23	1·26	17·31
Gawler	1·41	1·82	1·36	19·21
Two Wells	0·33	0·90	1·18	16·36
Virginia	0·14	0·98	1·22	17·58
Smithfield	—	0·73	1·03	17·30
Salisbury	0·13	0·66	1·30	18·57
North Adelaide	0·53	1·50	1·25	21·49
Adelaide	0·34	1·41	1·33	21·04
Brighton	0·20	0·78	1·13	19·93
Glenelg	0·12	0·82	1·09	18·35
Magill	0·50	1·74	1·45	25·69
Glen Osmond	0·56	1·50	1·51	25·20
Mitcham	0·25	1·07	1·32	23·47
Belair	0·23	0·23	1·62	28·64

RAINFALL—*continued.*

Station.	For Feb., 1914.	To end Feb., 1914.	Av'ge. to end Feb.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.				
Houghton	—	—	—	—
Teatree Gully	0·08	1·37	1·49	28·19
Stirling West	0·72	1·89	2·46	46·70
Uraidla	0·63	2·38	2·18	44·35
Clarendon	0·32	0·89	1·89	33·67
Morphett Vale	0·33	1·00	1·40	23·32
Noarlunga	0·09	0·47	1·17	20·28
Willunga	—	0·54	1·43	25·98
Aldinga	0·19	0·73	1·03	20·34
Normanville	0·09	0·52	1·12	20·65
Yankalilla	0·05	0·17	0·98	22·78
Cape Jervis	0·07	0·27	0·91	16·34
Mount Pleasant	0·31	1·78	1·46	26·87
Blumberg	0·32	2·54	1·74	29·38
Gumeracha	0·26	1·73	1·78	33·30
Lobethal	0·30	1·53	1·76	35·38
Woodside	0·90	1·79	1·78	31·87
Hahndorf	0·59	1·49	1·78	35·45
Nairne	1·16	2·03	1·86	28·83
Mount Barker	0·69	1·80	1·89	30·93
Echunga	0·89	1·53	1·82	32·83
Macclesfield	1·59	2·04	1·60	30·72
Meadows	1·93	2·26	1·83	35·52
Strathalbyn	0·55	0·93	1·38	19·28
MURRAY FLATS AND VALLEY.				
Wellington	0·65	1·23	1·28	15·01
Milang	0·12	0·20	1·22	16·08
Langhorne's Bdge	1·58	1·79	0 94	15·27
Tailem Bend	0·70	1·42	—	—
Murray Bridge	0·59	0·99	1·10	14·32
Callington	0·90	1·45	1·29	15·65
Mannum	0·60	1·38	0·93	11·67
Palmer	1·00	1·52	0·95	15·60
Sedan	0·33	1·15	0·91	11·92
Blanchetown	0·18	0·45	1·11	10·71
Eudunda	0·65	0·96	1·33	17·33
Sutherlands	0·39	1·27	0·69	10·60
Morgan	0·16	0·52	0·95	9·29
Overland Corner	—	0·25	1·13	11·42
Renmark	0·11	0·17	1·08	10·93
Loxton	0·03	0·11	—	—
WEST OF SPENCER'S GULF.				
Eucla	0·33	0·33	1·19	10·13
White Well	—	0·03	1·03	9·67
Fowler's Bay	—	0·04	0·80	12·11
Penong	—	0·08	0·90	11·93
Murat Bay	0·02	0·14	—	—
Smoky Bay	—	0·05	—	—
Streaky Bay	—	—	0·93	15·31
Port Elliston	0·04	0·04	0·88	16·49
WEST OF SPENCER'S GULF—*continued.*				
Port Lincoln	0·06	0·24	1·13	19·88
Tumby	0·03	0·23	0·75	15·00
Carrow	0·04	0·37	—	—
Cowell	0·40	0·81	0·84	11·76
Point Lowly	0·05	0·18	1·14	12·21
YORKE'S PENINSULA.				
Wallaroo	0·13	0·26	0·99	14·05
Kadina	0·24	0·41	0·91	15·88
Moonta	0·19	0·75	0·94	15·22
Green's Plains	0·07	0·23	0·89	15·73
Maitland	0·15	0·52	1·09	20·08
Ardrossan	0·14	0·55	0·90	13·89
Port Victoria	0·14	0·70	0·84	15·20
Curramulka	0·14	0·62	0·99	18·51
Minlaton	0·03	0·79	0·86	17·41
Stansbury	0·06	0·56	1·00	17·06
Warooka	0·04	0·67	0·88	17·71
Yorketown	0·02	0·32	0·87	17·47
Edithburgh	0·20	0·56	0·96	16·48
SOUTH AND SOUTH-EAST.				
Cape Borda	0·09	0·35	1·21	25·09
Kingscote	0·22	0·22	0·88	18·95
Penneshaw	0·35	0·51	1·18	21·34
Cape Willoughby	0·23	0·25	1·29	19·69
Victor Harbor	0·69	0·95	1·44	22·18
Port Elliot	0·37	0·61	1·36	20·33
Goolwa	0·92	1·16	1·28	17·93
Pinnaroo	0·13	0·38	1·19	16·74
Parilla	0·19	0·48	—	—
Lameroo	0·16	0·71	1·17	16·55
Parrakie	0·19	0·48	—	—
Geranium	0·15	0·53	—	—
Peake	0·27	0·61	—	—
Cooke's Plains	0·38	0·91	0·99	14 74
Meningie	0·15	0·32	1·23	18·87
Coonalpyn	0·23	1·63	1·17	17·49
Tintinara	0·08	0·52	1·25	18·78
Keith	0·18	0·80	—	—
Bordertown	0·21	0·48	1·29	19·76
Wolseley	1·28	1·52	1·01	17·72
Frances	0·71	0·82	1·23	20·74
Naracoorte	0·08	1·05	1·46	22·60
Penola	—	0·35	1·89	26·78
Lucindale	0·11	0·49	1·32	23·32
Kingston	0·51	0·83	1·36	24·73
Robe	0·77	0·88	1·45	24·69
Beachport	0·70	0·87	1·75	27·51
Millicent	1·30	1·92	1·90	29·25
Mount Gambier	0·17	0·90	2·50	32·00
C. Nrthumberland	0·69	1·18	1·81	26·63

AGRICULTURAL BUREAU REPORTS.

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Arden Vale & Wyacca	*	—	—
Arthurton	874	—	—
Balaklava	*	—	—
Bandon	*	—	—
Beetaloo Valley	*	—	—
Belalie North	*	7	4
Berri	879	7	4
Blackwood	883	9	13
Blyth	870	7	4
Booleroo Centre	*	—	—
Borrika	*	—	—
Bowhill	*	—	—
Burra	*	6	10
Bute	*	—	—
Butler	*	—	—
Caltowie	*	—	—
Canowie Belt	*	—	—
Carrieton	†	12	9
Cherry Gardens	883	10	7
Clanfield	*	—	—
Clare	871	12	9
Clarendon	*	9	6
Claypan Bore	*	—	—
Colton	*	7	4
Coomandook	878	—	—
Coomooroo	868	14	11
Coonalpyn	879	—	—
Coonawarra	*	—	—
Coorabie	‡	—	—
Cradock	*	—	—
Crystal Brook	*	—	—
Davenport	*	—	—
Dawson	*	—	—
Dingabledinga	*	—	—
Dowlingville	†	—	—
Elbow Hill	876	—	—
Forest Range	*	12	9
Forster	*	—	—
Frances	*	6	10
Freeling	872	—	—
Friedrichswalde	†	—	—
Gawler River	873	—	—
Georgetown	*	7	4
Geranium	*	28	25
Gladstone	*	—	—
Glencoe	*	—	—
Goode	*	—	—
Greenock	*	—	—
Green Patch	876	9	6
Gumeracha	*	10	7
Hartley	883	11	8
Hawker	*	9	6
Hookina	†	10	7
Inman Valley	*	—	—
Ironbank	883	6	10
Julia	‡	—	—
Kadina	874	10	7
Kalangadoo	*	14	11
Kanmantoo	*	7	4
Keith	*	7	4
Kingscote	*	3	7
Koppio	878	—	—
Kybybolite	*	12	9
Lameroo	*	—	—
Laura	870	6	10
Leighton	*	—	—
Lipson	*	—	—
Longwood	883	11	8
Loxton	*	—	—
Lucindale	†	14	11
Lyndoch	*	5	2
MacGillivray	*	—	—
Maitland	875	5	2
Mallala	872	2	6
Mangalo	*	—	—
Mannum	*	—	—
Mantung	*	—	—
Meadows	880	10	7
Meningie	*	7	4
Millicent	†	10	14
Miltalie	878	7	4
Minlaton	875	12	9
Mitchell	*	14	11
Monarto South	880	—	—
Monteith	879	—	—
Moonta	*	—	—
Moorlands	*	—	—
Morchard	*	—	—
Morgan	*	—	—
Morphett Vale	881	—	—
Mount Barker	883	11	8
Mount Bryan	*	7	4
Mount Bryan East	*	7	4
Mount Gambier	*	—	—
Mount Pleasant	883	13	10
Mount Remarkable	*	11	8
Mundoora	870	—	—
Myponga	*	—	—
McNamara Bore	†	—	—

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North Bundaleer	*	—	—
Northfield	*	3	7
Orroroo	*	—	—
Parilla	*	—	—
Parilla Well	*	—	—
Parrakie	*	7	4
Paskeville	874	12	9
Penola	*	7	4
Penong	*	14	11
Petina	876	—	—
Pine Forest	875	10	7
Pinnaroo	*	—	—
Port Broughton	†	6	10
Port Elliot	*	21	18
Port Germein	†	7	11
Port Pirie	869	—	—
Quorn	867	7	—
Redhill	*	10	7
Renmark	*	—	—
Riverton	*	—	—
Roberts and Verran	877	—	—
Saddleworth	873	20	17
Salisbury	*	3	7
Shannon	*	—	—
Sherlock	*	—	—
Spalding	870	20	10
Stockport	*	—	—
Strathalbyn	‡	—	—
Sutherlands	†	7	4
Tarcowie	867	10	7
Tatiara	†	7	4
Tintinara	*	—	—
Two Wells	873-4	—	—
Uraidla and Summert'n	*	2	6
Utera Plains	878	7	4
Waikerie	880	—	—
Warcowie	*	—	—
Watervale	*	—	—
Wepowie	†	—	—
Whyte-Yarcowie	869	—	—
Wilkawatt	879	—	—
Willowie	*	6	3
Willunga	*	7	4
Wilmington	*	11	8
Wirrabara	867	14	11
Wirrega	*	—	—
Woodside	*	—	—
Wynarka	*	—	—
Yabmana	878	-	—
Yadnarie	*	7	4
Yallunda	*	7	4
Yongala Vale	*	9	6
Yorketown	†	14	11

* No report received during the month of February. † Formal report only received.
‡ Held over until next month.

ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

March 11th and April 8th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD)

QUORN (Average annual rainfall, 13·78in.).

February 7th.—Present: six members.

The Season's Harvest.—Mr. Brewster read a paper. The rainfall during the past season, he said, was the lowest recorded for some years. Very little wheat in this district germinated before August. Better results, he thought, would have been secured had the seeding been completed after the first good rains in March or April. Federation was the best wheat for the district. Baroota Wonder and Bunyip were also suitable. Cocky chaff had been of considerable value during the past two seasons, and on this account the use of the stripper was advisable. Mr. Cook preferred to distribute the seeding over a reasonable time. Mr. Schultze advised early sowing in clean land.

TARCOWIE (Average annual rainfall, about 15½in.).

February 10th.—Present: 12 members.

Storing Wheat.—Mr. T. Ninnis contributed a paper on storing wheat on the farm. A good barn was of great importance, especially in wet districts. Galvanized iron was the best and most economical material for building this. Good ventilation was necessary, and a good plan, where the farmer intended storing the wheat for a few months after harvest, was to stack it in a good shed with a straw roof. This was cooler than iron. Wheat for seed stored in the open should be placed on sufficient dunnage to keep it well off the ground and with an iron roof to keep out rain. There was less trouble with smut in crops sown from seed stored in the open. If mice were troublesome the bags should be placed far enough apart to enable a cat to get between them, pieces of newspaper being placed between the bags. The mice would then nest with the paper instead of destroying the bags. Where the farmer possessed a good barn, and intended keeping the wheat through the winter, and the mice were very troublesome, he could empty the wheat into a heap, as they could not burrow into loose wheat. The writer emphasised the necessity for protecting the wheat from damp and stacking it in the open. In the discussion which followed, Mr. Breuer said the barn floor should be made of concrete. Care should be given to ventilation. Mr. Symon preferred a wooden floor. Mr. Dempster thought that as wheat gained by storage, the practice of holding the wheat on the farm paid for the extra trouble. Competition for the line was encouraged also.

WIRRABARA (Average annual rainfall, 18·91in.).

February 14th.—Present: 18 members and several visitors.

Root Borer.—Mr. P. J. Curnow read a paper. "In every old garden in this district can be found old apple trees suffering from 'die back.' Various reasons are given for the dying off of the top branches of these trees. In some cases where rows of trees cross low-lying ground that becomes waterlogged in the winter, the feeding roots die off and the tree soon shows signs of loss of vitality. Even on dry, rising ground apple trees die off and finally die out altogether. This experience befel the writer years ago in the Wirrabara Forest, when planting his first orchard. On limestone land the apple trees grew well for a number of years, when many showed signs of 'die back' in the tops. A careful examination of the main roots showed no disease, and it was concluded that the dry seasons then experienced on land without a clay bottom were the cause. Quite two-thirds of this orchard was affected. Trees, when cut back, would grow again, and then die back to the starting point in one season. Realising that this orchard would become unprofitable, the writer then planted a new one on better land, although a strip of limestone crossed this. When the trees were four years old some on the lighter ground commenced to go off. The next season a large number were affected. Realising that some pest was at work, a careful search was made. Trees were dug out bodily and long roots were followed out to the feeders. The larvæ of a beetle was found in a tunnel 2ft. and 3ft. around the roots. A yellowish-white grub was found in August. It was about ½in. long, and afterwards developed into a beetle 1in. long. This insect has since been studied and its habits noted, and the following facts ascertained:—It is a root borer, and belongs to the family *Teptops*. The variety found in the Adelaide hills is known as *Teptops robusta*, and that at Wirrabara is a sub species, the markings not being quite the same. The fearfully destructive Victorian species is known as *Teptops hopei*, and is said to be worse than our own variety. Forty-four varieties of these root borers have been identified in Australia, so that these destructive insects are widespread in the various fruit-growing districts. During the winter months the larvæ remain dormant. As spring approaches the grubs gradually change to the beetle form and emerge at the end of September and into October and November. In October the two sexes go into the tree tops to copulate. The female deposits her eggs on an apple leaf, brings the edges together, fastens with a sticky substance, and then, presumably, dies. The eggs hatch, and the young feed on the leaf substance up to a certain period, when they descend the tree trunk, enter the earth, and start the work of destruction. They gnaw the root bark and eat spirally around the roots, really ring-barking the tree feeders. The orchardist first notices the leaves on an affected tree withering. Later, limbs start to die back, and in a badly affected case (where scores of grubs are eating at once) all the leaves drop in one season. If nothing is done, next season the same grubs go on gnawing, and the tree will die right out in a few weeks after starting growth. After soil fumigation had been tried picking the beetles from the trees was resorted to, with fair results. Nearly 600 beetles were caught the following spring after the application of the above remedy, and since then no other plan has been adopted. On the orchard at first attacked it was noticed that affected trees began to recover as soon as arsenate of lead sprays were adopted, and some of these trees have so far recovered that they now bear payable crops. On the new orchard the trees were yet young when attacked and had never been sprayed for codlin moth. They have now been sprayed for three seasons, and the root borer has been checked, for no doubt the beetles fed on the poisoned leaves and are thus destroyed. As many as four and five dead insects were picked last spring from under one tree the day after spraying. These root borers do not hatch after entering the soil for at least three seasons. They thus go on with their destructive work as they grow, and are very difficult to kill with a soil fumigant. The only plan to adopt with young trees in an affected orchard is to hand pick the trees every 10 days during the spring months. Give each tree a vigorous shake and the beetles curl up their legs as though dead and drop to the ground. They can then be killed. As soon as a good arsenate of lead spray is used no further trouble will occur. After the apple trees in the new orchard died out, peaches were at once put in. The grubs attacked these, killing many the first season. It is wise not to dig out the old stumps and plant peaches straight away. It would be better to leave the holes empty for one season. Then the grubs would hatch out and the trees would not suffer. This plan has been found to work very well.

COOMOOROO, February 14th.—Wounds in Horses.—The Chairman (Mr. E. Berryman) dealt with this subject in a paper. Mr. E. Brice advised the use of carbolic for treating wounds. Blacklead and lard, applied before the harness was put on and after the day's work, was good for sore shoulders. Mr. Barber recommended boot blacking and beer for treating skin deep wounds.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

NORTH BOOBOROWIE (Average annual rainfall, 16·35in.).

November 12th.—Present: 17 members and 12 visitors.

Wheat-Cleaning.—Mr. S. E. Mudge read a short paper. The winnower should be firmly fixed, he said, and if a good steady wind prevailed this should slightly cross the machine. A straight belt on the machine was preferable, and a fork or shovel far superior to a dish for filling. Two sieves were sufficient, an oat sieve only being used when the grain was being put through a second time.

Short addresses were also given by Mr. F. E. Waddy, "Stooking"; W. C. Warner, "Stack-building"; W. E. Hannaford, "Bag-sewing"; and E. J. Dunstan, "Carting."

NORTH BOOBOROWIE (Average annual rainfall, 16·15in.)

February 12th.—Present: 17 members and six visitors.

Harvest Report.—Owing to the lateness of the rains, seeding in this district extended from the end of April to the middle of July. In one or two cases early sown seed malted badly. The amount of super. used varied from 30lbs. to 100lbs. per acre, and the seed averaged about 1¼bush. The average yield on fallow was about 23bush. and on stubble about 15bush. per acre. No cases of rust were reported, and bunt only occurred where pickling of seed had been neglected. The sample in most cases was a trifle pinched. The lateness of the season and malting of seed prevented definite conclusions being drawn as to best yielding varieties for district. Federation and Yandilla King were mostly grown and yielded well, while Lotts, Leatherhead, and Viking also gave good results.

Demonstration Plots.—A committee, consisting of Messrs. W. B. Ashby, W. E. Hannaford, and A. V. Simpson, was appointed to supervise experimental and demonstration plots. It was intended to conduct a variety test of the following wheats:—Triumph, Bayah, Federation, Lotts, Leatherhead, Yandilla King, Marshall's No. 3, and Improved Dart's Imperial.

PORT PIRIE (Average annual rainfall, 13·21in.).

January 14th.—Present: 10 members and a number of visitors.

Demonstration Plots.—A committee, consisting of Messrs. J. Greig, W. R. Wright, and C. B. Welch, was appointed to supervise wheat variety tests to be carried out by the Hon. Secretary (Mr. A. M. Lawrie).

The Season.—Mr. T. Johns read a paper, in which he detailed the weather conditions which had prevailed during the season just passed. The absence of feed, he said, had impressed on farmers the need for conserving straw and cocky chaff to tide their stock over periods of shortage of rainfall. Messrs. Greig, Eagle, and Munday took part in a discussion on the subject.

Homestead Meeting.—The meeting was held at the homestead of Mr. T. Johns, and members inspected the buildings, machinery, &c.

WHYTE YARCOWIE (Average annual rainfall, 13·91in.).

February 7th.—Present: 11 members.

Treatment of Seed Wheat.—Mr. G. McGregor, in a paper on this subject, gave his experiences in connection with the grading and pickling of seed. The former practice he strongly recommended. Last year he sowed Bluey wheat, pickled and unpickled. There was slightly more smut in the latter than in the treated seed, but the untreated crop came up much thicker. Leatherhead, pickled, was slightly affected, but the crop from unpickled seed was very dirty with smut, although it was a one-third better crop, and the best piece he had for hay. Federation was quite free of the fungus. His conclusion was that whilst pickling to a large extent prevented the development of smut, it also destroyed the germinating power of a large portion of the seed. [One pound of bluestone to 10galls. of water is, in the opinion of Professor Perkins, quite strong enough. Stronger solutions are apt to impair the germinating powers of the grain. See page 1163, May, 1913, *Journal*.—Ed.]. Mr. Wittwer had used the grader with good results. In the year 1893 he sowed wheat dry and unpickled in March. That sown between sunrise and 10 a.m. was badly affected with bunt, whilst that sown later in the day was practically free. He noticed the same thing where he sowed pickled wheat, with the difference that the smut did not affect the crop nearly so badly where pickled. He was a strong believer in using salt with the bluestone. Last season he used one-eighth of a pound bluestone and a handful of common salt to the bag of seed [How much water?—Ed.], with the result that he could find practically no smut in the crop. Mr. McLeod had tried water heated to 130 deg. Fahr., but whilst his crop was free of smut it germinated very indifferently. He did not know if this was due to injury from hot water or to the season, which was not favorable to good germination. Mr. Sack believed that generally a plump grain would give the stronger plant. With regard to pickling, his experience had been similar to that of the writer of the paper. From his crop grown from unpickled seed he picked two heads, one of which was smut all the way up on one side and half-way up on the other, the balance of the sets being sound grain. The other head had smut on one side and sound grain on the other. Other members noticed similar heads. The crop referred to was not badly affected, and both the heads were from the same plant. The Hon.

Secretary had picked a head with only the top two grains sound and all the rest smut. This was from a very smutty crop. Mr. Robinson's crop had suffered severely from smut during dry weather. He had sown some unpickled and some pickled, and could not see any difference, both being badly affected. Where he fed the crop off in the early spring (August and September) it was worse than the portion unfed. Other members had noticed the same thing. One instance was given where a crop badly smutted had been cut for hay, being green when cut There was a fair quantity of second growth; on examination these plants were found to be all smut. The Hon. Secretary had a paddock of Federation badly affected. The seed sown on this was not entirely free of smut, but it had been carefully pickled with bluestone—¼lb. to the bag of seed. This was the first occasion in an experience extending over a period of 30 years that he had had a badly smutted crop when pickled as above. The Chairman had a long experience of the use of bluestone and had never had a badly affected crop. He had frequently had a badly smutted crop where, to save time and trouble, he had sown a small quantity without pickling.

Storing Grain for Seed in Bulk.—Mr. McGregor also read a paper on this subject. For those farmers who possessed a suitable barn, the best method for holding grain for seed was to erect a row of mouse-proof binns along one side of this. This year he had erected a series of galvanized iron tanks of 1,000galls. capacity, to hold wheat and oats for seed. A 4in. galvanized iron pipe socket outlet was put into each for the purpose of emptying. Each tank would hold about 125bush., and cost £2 19s. 6d., slightly over 5½d. per bushel. These could be used for holding water when so required. Larger tanks, not soldered, would be proportionately cheaper per bushel, but they could not be used for storing water. Grain stored in these was protected from the weather and vermin.

LAURA, February 20th.—Inaugural Meeting.—The inaugural meeting of this Branch was attended by Messrs. F. E. Place, B.V.Sc., M.R.C.V.S. (Government Veterinary Lecturer), and G. G. Nicholls (Secretary Advisory Board). Addresses were delivered by these officers.

MUNDOORA, February 13th.—Harvest Reports.—Members reported that the harvest returns were low, due to the light rainfall and the excessive wind. The averages were from 4½bush. to 11bush. to the acre. The following varieties gave the best returns: —Gluyas, German Wonder, Marshall's No. 3, Bunyip, and Carmichael. Mr. Dolling had tried summer fallowing for five years, and had found that land thus treated returned the best crops, free from takeall.

NARRIDY, February 7th.—Pickling Wheat.—Mr. W. F. Nicholls initiated a discussion on this subject. Members generally were of the opinion that the floor method was the best for pickling seed wheat.

SPALDING, January 24th.—Homestead Meeting.—The meeting was held at the homestead of Mr. E. E. Gill. A profitable hour was spent inspecting the homestead. A fine plantation of young gums was greatly admired. Mr. Gill had planted the red gum of South Australia mostly, and considered it one of the most valuable of the species. A plot of lucerne of splendid growth commanded attention; although it had been irrigated for several years with water that contained a high percentage of minerals, no harmful results were apparent. Mr. Gill had also grown a fine lot of onions. He carried on poultry-raising extensively.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16·46in.).

February 7th.—Present: 17 members and four visitors.

Forage on the Farm.—The Chairman (Mr. A. L. McEwin) contributed a paper under this heading, in which he said that farmers should, when the seasons were good, store extra fodder against periods of shortage. The following is extracted:—"My experience is that the farmer is too anxious to secure his 100 bags of wheat, and sell it for £50, rather than put the crop into fodder, which would be worth £100 later. Ten years ago a great deal was heard about dry bible and the tremendous loss of stock through it. To-day very little is heard of it, and only in dry districts, where feed was scarce and green fodder still more so. Most farmers have realised that prevention is better than cure, and that prevention is feeding. I have been farming in this district since 1884, and only in one season did I pay dearly through the loss of stock by not paying proper attention to the proper provision for fodder. If I could not grow hay I purchased it. Hay is the only practical fodder for farmers in the dry districts, and even in wet ones it has to be the main stay, in fact nothing can take the place of it. Whatever is grown has to be fed with hay. For working animals it must be the great standby. Good hay will always keep a cow in good heart and will give a good return for that which is given, especially if it is chaffed and fed with bran. The farmer should grow five tons of hay for every horse he has in the stable, unless he has a very good turn-out paddock for use during slack times. In a good season if half as much is carried over one would soon have a reserve, as bad seasons, in my experience, for hay-cutting are about one in three. It is rare that we get two successive seasons failures. My paper applies to country which has an average rainfall of 13in. or 14in. Country with an average of 16in. or 17in. rarely fails from the point of fodder if anything like proper cultivation is done and good farming methods are carried out. A great deal has been written about ensilage, and farmers have been encouraged to go in for it; but from all I have seen of it there is too much labor involved for it to be of very great use to the farmer. Generally, where one can make good ensilage he can make a good hay very much more cheaply. Ensilage is of no use for working stock, but is an advantage for milking cows, and, no doubt, if dairying is being carried on it is necessary to provide succulent food for the summer months. Farmers can grow a better quality of hay by mixing wheat and oats together and crossdrilling. A good mixture for our heavy lands is 50lbs. King's Early and 40lbs. Cape oats crossdrilled with not less than ½cwt. manures sowed with each. Algerian oats with Yandilla King makes good hay. These ripen very well together. Oats require to be cut on the ripe side. I recommend every farmer to grow some oats for feeding his horses in the winter when the work is heavy. They put condition on and life into a horse."

CLARE (Average annual rainfall, 24·30in.).

January 9th.—Present: 16 members.

Ration Sheep and Sheepskins.—A paper was contributed by Mr. A. Hill. When a sheep had been killed and skinned, the tongue should be removed and the head cut off, he said. The neck should then be opened and the paunch pipe tied. When cutting the brisket, one side of the sheep should be held in the hand, the elbow being placed against the other side. Skinning should be commenced at the off fore leg; the near fore leg should then be cut, and the brisket punched back as far as the crutch. The carcass could then be hung and opened down the front, the skin being punched off. The habit of throwing skins carelessly over a rail to dry in the sun was not a good one. As a consequence, there was a big loss in value. By exposure to the sun the basil became dry and shrivelled and lost in market value. It was a good plan to hang the skins on a rail and fasten them with a couple of nails by the neck and tail, leaving the trotters on. They then became evenly stretched and smooth in appearance, bringing a much better price than if no trouble were taken. In packing the skins for sale the trotters should be removed, and the skins packed wool to wool. For prevention of weevils a dressing made of arsenic and vinegar, or strychnine and vinegar, was very effective. Mr. Jarman stated that a wooden rack was used at Roseworthy College for hanging skins. They were fastened on to three hooks, hinder part up, and a stick placed between the front legs to stretch the skin out. Mr. Pattullo sent his skins to Adelaide as soon as possible, as he found that by keeping them until he would have a large quantity only encouraged the weevil pest.

CLARE (Average annual rainfall, 24·30in.).

February 7th.—Present: 17 members and two visitors.

Co-operation.—This subject was dealt with in a paper by Mr. J. C. Dux. If 50 farmers formed a co-operative society, he said, with the area they held, about 20,000 acres (which would mean that they would be cropping 7,000 acres annually), they would require about 300 tons of super. By purchasing this in bulk the executive could save the agent's commission, i.e., £37, and on their requirement of about 40,000 cornsacks they should save £333. The large parcel of wheat which they could handle could be sold in, say, 10,000 bag lots, for which they could secure an extra 1d. per bushel. A draught stallion could be procured conjointly, and fees for a first class animal would only cost the members about £1 per service, if the animal were used for five years. The same system could be applied to dairy cattle and other lines. Mr. Nolan was sorry that co-operation was not favored as it should be in Australia. The people only needed educating up to the benefits of co-operation amongst themselves to make them put it into practice. Mr. Pattullo said co-operation was tried some time ago by a number of northern farmers, but the scheme fell through owing to some of the members selling their wheat to outside merchants, who gave 1d. per bushel more than their co-operative body was prepared to give.

Elementary Education for our coming Farmers.—Mr. Pattullo read an article on the above subject printed in the *Register* on January 5th, and written by Mr. A. G. Edquist, Lecturer on Nature Study in State Schools. The subject was well discussed by all members. Mr. Jarman considered producers did not give their sons a proper agricultural education, especially when the Government offered facilities to ensure it. He spoke at length on the way some producers criticised the Roseworthy Agricultural College, and said that that institution should be judged by some of the ex-students—such men as Messrs. Richardson, Colebatch, and others who had gone through the course—and not by the duffers. He thought a high school should be established at Clare. Such a school would bridge over the gap between the time a boy left the State school and when he would be old enough to attend the Agricultural College. He would be one of the first to help get such a school established. He moved "That a committee be formed to work in conjunction with the Clare Vigilance Society with the object of making representations to the Government for a high school to be established in Clare; such committee to consist of Messrs. J. Dux, W. Pattullo, F. W. H. Lee, M. L. Nolan, R. Hunter, and the Hon. Secretary." Carried unanimously. It was resolved that Mr. Jarman be added to the committee.

FREELING (Average annual rainfall, 17·89in.).

February 5th.

Thatching Stacks.—Mr. A. J. Kuhlman read the following paper:—"The stack should be built with a gable, and not a hip roof, the latter being rather awkward for covering. Have a sufficient quantity of sheaved straw ready at hand, and dampen this well. This will cause it to lie closer and firmer on the hay. Begin to place the straw at the eaves on one end of the stack and finish one side before commencing the other. Before laying the straw fix a board 6in. or 8in. wide and 4ft. long by resting it on two small sticks driven into the stack at a sharp angle. This will prevent the first layer of straw from falling down. Then proceed by opening the sheaves of straw, just cutting the twine and placing the whole thickness of the sheaf with the thick end on the board, so that the sheaf lies at right angles to the eaves. Continue in this way until the layer is 3ft. wide. Then put the next layer with the butt end upwards, and so keep alternately reversing the sheaves until the ridge of the stack is reached. Beat the straw well down with a stick, and cover this 3ft. of straw with wire netting of 3in. mesh. See that the netting projects 6in. below the eaves and hang a small weight on to it. This weight can be prevented from swaying, and thus eventually cutting the netting, by tying it with binder twine to a stick pushed into the side of the stack. On the ridge of the stack roll up the netting required for the other side, and fix it firmly with a stick pushed through the netting into the stack. When the second width of 3ft. has been covered with netting, couple the netting in a few places with binder twine. This will obviate the necessity for attaching a weight on each width. Proceed in this way until one side is finished. Half of each length of wire netting will then be rolled up and fixed on the ridge of the stack. When a width of 3ft. has been laid down the other side, pull the netting over it and fix it as before, coupling the netting with the next width with twine, and continue so until the thatching is completed. No matter how strong the wind may be it will not be able to shift the least quantity of straw. Six feet wire netting is not so convenient for thatching or for when the stack is being opened. The initial cost to thatch a stack of about 160 tons of hay is £2 5s. for wire netting. Sticks and twine would cost £4 1s. 10d. The netting will last many years if taken off carefully, and there is no loss whatever from bad weather, it will be found to be cheaper than thatching with sticks and twine. Moreover, the sticks lead the rain into the stack. Some years ago I helped to remove two stacks of hay—one covered with sheaved straw and the other with loose straw. The latter was very much damaged by mice, whereas the one thatched with sheaved straw was only slightly damaged. Perhaps it was because the sheaved straw, not being put on so thickly, was too cold for the mice. This method of thatching haystacks is, in my opinion, the best and safest, as well as a very quick way of securing hay from damage."

MALLALA (Average annual rainfall, 16·88in.)

February 2nd.—Present: six members and one visitor.

Harvest Report.—Members discussed the results of the harvest just closed. Mr. A. V. Nairn reported that Gluyas wheat had yielded best, averaging 9bush., while King's

Red (which was best last year) averaged only 4½bush. The latter was badly affected by rust. Gluyas was slightly affected. Bunyip averaged 6bush. The Cape and English barley turned out as well as the previous year, *i.e.*, 25bush. He fed off 120 acres of his crop at the end of August, then scarified it over for fallow. He did not think that his crop would more than pay the expense of putting in and taking off. Mr. Konzag's best crop was that which he had sown during the first week in August. Baroota Wonder was very pinched. Le Huguenot, which would have cut 2 tons of hay to the acre, only averaged 6bush. His crop right through averaged 6bush. of grain and about 15cwts. of hay. Mr. Curnow's harvest turned out better than was at first expected, but not as well as the previous year's. His hay (Baroota Wonder and oats) averaged 18cwts. to the acre. Gluyas and Le Huguenot both averaged 9bush. of grain. Calcutta Cape oats averaged 12bush. Twenty acres of rye averaged 12bush. The grain sold for 3s. 3d. per bushel and the straw at £3 5s. per ton. Mr. Temby reported having had a better harvest than that of the previous year. Marshall's No. 3 had turned out best and averaged 10bush. Fifty acres of King's Red, sown during the first week in August, averaged 8bush. Baroota Wonder, which would have cut 30cwts. of hay. yielded between 6bush. and 7bush. of grain. Gluyas and Marshall's No. 3 were least affected by rust. Oats sown on stubble ground in May cut a ton to the acre. The same crop on fallow yielded 15bush. to the acre. Cape barley sown on stubble in April yielded 15bush. per acre.

SADDLEWORTH (Average annual rainfall, 19·69in.).

January 16th, 1914.—Present: five members.

Trees near Crops.—The Chairman (Mr. F. H. Kelly) drew attention to the influence of trees upon the adjoining crop in such a season as that just closed. He estimated that at least three acres of his wheat paddocks, fallowed, well cultivated, and sown, had been rendered quite valueless as a result of the presence of gum trees in or near the crop. The injury was worse from trees in the road near the fence and crops than from the few he had growing in the paddock, since the camping of sheep under the latter resulted in at least some hay being grown near the spread of the tree. With land at £9 to £10 per acre this matter was a serious one. On the other hand, there was a strong objection to the destruction of fine trees along the district roads when they were not in any way an interference to the traffic. Shade, shelter from strong winds, and beauty had their claims also.

TWO WELLS (Average annual rainfall, 16·36in.).

January 13th.—Present: 10 members.

Poultry.—This subject was dealt with in a paper by Mr. A. A. Wilson. It was essential he said, that the farmer should give proper attention to the breed of the fowls he kept. If eggs were the objective, a few first-class White Leghorns should be secured from a reliable breeder. If table birds were required, these could be crossed with the Black Orpington. The cockerels selected for breeding should be young, stand erect, be broad in the body, and active. Breeding hens should be two years old. Good houses could be made with jarrah uprights, deal runners, and iron. The height at the back should be 5ft,. the front being open. Perches could be swung from the roof. All the woodwork should be tarred. A shed 30ft. long, 5ft. wide, and 6ft. 6in. high in the front would accommodate 200 to 250 birds. A concrete floor should be put down. It should be cleaned weekly, and dusted with slack lime. Two or three times yearly it should be sprayed with a mixture of hot soapsuds and kerosene. At the beginning of the summer a coat of whitewash would result in the shed being cooler. In the mornings the birds should receive a hot mash of two parts pollard and one of bran, and at night hard wheat, with the addition of a little malting barley. Plenty of green feed, in the shape of lucerne, Egyptian clover, or maize should be provided. Grit and charcoal and good clean water were essential. Broody hens which were sitting should be given a mixture of barley and wheat, the former preponderating; soft feeds encouraged the birds to eat the eggs. Eggs placed in an incubator should be well shaped and of good size, and not over eight or nine days old. The machine should be working from the first week in April to the first or second week in October. Late chicks were not thrifty. The chicks should have plenty of grit during the first 24 hours after hatching, and then ground wheat. Plenty of water should always be available in earthern vessels. The sexes should be separated immediately they were determinable.

GAWLER RIVER, February 6th.—Subsoiling by Dynamite.—In the presence of 20 members, Mr. H. E. Laffer, of the Roseworthy College, gave a demonstration in subsoiling by explosives in Mr. A. M. Dawkins' orange garden. It was plainly seen by those present that this was a very easy and effectual method of dealing with established orchards where trees had apparently come to a standstill through the roots being unable to penetrate the hard and poor layer of subsoil to the richer and deeper soil below. Where each charge had been fired the subsoil was found by digging to be effectively cracked through and broken up. In one hole a hose was placed and let run for about an hour, at the end of which time no water was visible on the surface, as was the case where the subsoil had not been burst up. It was evident that by means of explosives the soil could be prevented from becoming set tight and waterlogged. All present were kindly entertained at tea by Mr. and Mrs. Dawkins. In the evening, at the Gawler River School, Mr. Laffer gave a lecture on the same subject, showing by means of a chart the different soils which may be successfully treated by explosives.

NANTAWARA, February 5th.—EXPERIMENTAL PLOTS.—Messrs. J. Nicholls, E. J. Herbert, and S. Sleep were appointed a committee to supervise experimental plots to be conducted by Messrs. Smith, Sutton, J. H. Nicholls, A. F. Herbert, T. Dixon, R. P. Uppill.

TWO WELLS, February 10th.—ANNUAL REPORT.—The Hon. Secretary read the annual report of the Branch.

SEASON'S RESULTS.—The Chairman reported that all varieties of wheat which he had sown last year were more or less affected with rust. Newman's Early and Bunyip suffered the least. Mr. Pratt said the rainfall for 1913 was the lowest for 10 years. Members mentioned that two days of severe heat, with cold nights, just before the grain ripened, had a very bad effect on the crops.

YORKE PENINSULA DISTRICT.
(TO BUTE.)

ARTHURTON (Average annual rainfall, 16in. to 17in.).
February 11th.—Present: 10 members and two visitors.

THE SEASON.—In a paper dealing with the season just passed, Mr. J. B. Rowe said the absence of rain to cause the weed seeds to germinate had delayed seeding operations. The land was dry sown, and as the season advanced without the expected fall, it was generally thought that the seed had malted. When rain at last fell, however, it germinated well and the wheat grew rapidly, but a hot spell and the appearance of rust just when the grain was maturing, blighted hopes of a good return. There were exceptional cases of good yields, however, one farmer in the sandhills having secured an average of 24bush. per acre from 200 acres.

KADINA (Average annual rainfall, 15·38in.).
February 7th.—Present: nine members.

DEMONSTRATION PLOTS.—The Branch elected a committee, consisting of Messrs. G. P. Bruce, J. N. Pedler, and B. N. Rodda, to supervise demonstration plots to be conducted by Mr. R. Correll.

PASKEVILLE (Average annual rainfall, 16·10in.)
January 8th.—Present: 12 members and one visitor.

HANDLING WHEAT IN BULK.—Mr. C. S. Lee read a paper on this subject; the following is extracted therefrom:—"The great wheat-producing centres of the world have long since adopted this system of handling their wheat, and with the high price of cornsacks and other disadvantages we, in the Commonwealth, are awaking to the fact that sooner or later we must adopt the same system. By comparison with our method of using sacks, Canada claims that her method of bulk handling is cheaper as regards labor, the dispatch is much quicker, and the waste of grain by vermin and other causes is reduced to a minimum, to say nothing of the big saving in cornsacks. By Canada's method quite half of the process is done by gravitation, which one can see at a glance must reduce the cost of handling. The question that naturally concerns everyone who contemplates a new process is the cost of installation. There are 1,025 terminal elevators near Lake Superior, with a holding capacity of 131,800,000bush., the largest being 6,500,000bush. and the smallest about 100,000bush. The cost of erecting a small building and plant is about £2,000, while some of the largest would cost from £40,000 to £50,000. The handling of wheat in the United States of America, with the exception of some ports on the Pacific coast, is done in bulk, in some cases even from the thresher to the wagon box. In considering the subject we must not lose sight of the fact that the threshing plant is used far more extensively than the harvester in these countries where bulk handling is adopted. As far as I can ascertain, the harvester is not mentioned in connection with bulk handling, although I see no insurmountable difficulty in applying the system where our class of harvesters is used. If we had to use bags to take the wheat from the harvester to the elevators, or even to the ships' sides, with care the same bags could be used at least four times, so that without elevators at our wheat-growing centres. and shipping wheat in bulk, we could save at least one quarter of the money we pay for bags, which at the present price would work out at about £7 per thousand. In America railroad companies in glut times make numerous concessions for wheat carrying. The cheapest transportation in the world is on the great lakes, where the cost is ·75 cents per ton per mile. There are three classes of elevators in the United States. Those owned by the farmers, by local grain dealers at the primary wheat markets, and those owned by elevator companies. Farmers from Australia and New Zealand now resident in Canada are enthusiastic in their praise of bulk handling as compared with our system, and some have even said that the Canadian system of bulk handling, coupled with their labor-saving implements, is equal to a saving of 1s. per bushel. If ever the system is adopted in South Australia, I should certainly advocate State-owned elevators. Farmers could then store their wheat with the State, and get liberal advances at a minimum rate of interest to meet any pressing engagements, and eventually sell when the market best suited them." Members agreed that the high prices ruling for cornsacks rendered the adoption of some such scheme as this necessary for the handling of grain.

PINE FOREST (Average annual rainfall, 14 15in.).

January 13th —Present: nine members, and three members of Port Broughton Branch.

Experimental Test.—The reports of experiments conducted during the year were received and considered. Mr. S. Barr had conducted a wheat varieties test, with the following results, which shows the variety and yield per acre :—

Variety.	Bush.	Lbs.	Variety.	Bush.	Lbs.
Gluyas Early	11	2	Baroota Wonder	9	6
German Wonder	11	0	Marshall's No. 3	9	2
Carmichael's Eclipse ...	10	27	Federation	9	0
Silver King	10	22	W.A. No. 4	8	51
College Section	10	19	Dart's Imperial	8	47
Marshall's Hybrid	10	17	Petatz Surprise	8	45
Yandilla King	10	15	Gallant	8	33
Nhill	10	3	Phillis Marvel.........	8	27
Comeback	9	7			

The plots were each one acre in extent, and were sown on 23rd and 24th May with 1bush. seed per acre and 80lbs. super.

Manurial tests were also conducted by Mr. Barr. German Wonder wheat was sown at the rate of 60lbs. per acre on May 22nd, 1913. The manures used and the yield secured were as follows :—

Plot.	Manure.	Yield. Bush.	Yield. Lbs.
1.	60lbs. super., 20lbs. ammonia	8	6
2.	80lbs. super., 20lbs. ammonia	8	48
3.	100lbs. super., 20lbs. ammonia	9	46
4.	130lbs. super.	11	8

The costs of the manurial dressings of plots 1 and 4 were equal.

Mr. R. Goodridge also conducted tests.

MAITLAND, February 7th.—Farm Implements.—Mr. F. P. Wundersitz read a paper on this subject. Immediately implements were finished with, he said, they should be well cleaned and repaired, and put away in an iron shed with a roof not less than 10ft. high. A coat of paint should be applied to the implements at least once every five or six years. Mr. W. Bawden favored painting the woodwork every three or four years. Mr. Bentley advised painting annually.

MINLATON, February 5th.—Underground Water.—An interesting lecture on the subject of underground water supply, and the formation of salt lakes on Yorke's Peninsula was delivered by Mr. R. A. Riddle.

WESTERN DISTRICT.

ELBOW HILL (Average annual rainfall, 11in. to 12in.)

February 7th.—Present: nine members.

WHEAT.—Mr. W. Bradley contributed a paper, in which he dealt with the history of the wheat plant. He mentioned that it was cultivated in China 3,000 years B.C., and detailed the extent of its cultivation throughout the world at the present. The quality of the grain varied considerably when grown in different soils and climatic conditions. In addition to the bearded and beardless kinds, the varieties were classified into red and white, according to the color of the grain. Whilst the red kinds were generally more hardy than the white, the grain was inferior; but this was in many localities counterbalanced by the greater productiveness of the crop. Long-strawed varieties yielded best in dry seasons, but the short-strawed wheats were best when the season was wet. Whilst the plant was particularly partial to clay and rich heavy loams, excellent crops could be secured from light sandy, gravelly, or chalky soils, with good cultivation. European wheat consisted of 14·83 per cent. water, 19·64 per cent. gluten, 0·95 per cent. albumen, 45·99 per cent. starch, 1·52 per cent. gum, 1·50 per cent. sugar, 0·87 per cent. oil, 12·34 per cent. vegetable fibre, 2 36 per cent. ash; the ash was rich in phosphoric acid, magnesia, and potash. The quantity of flour yielded by the grain varied from 54 per cent. to 80 per cent. Mr. Bowey said long-strawed wheats yielded best in the Maitland district. Heavier dressings of manure were advised. Mr. F. Freeth thought Yandilla King and Marshall's No. 3 the best varieties for the Elbow Hill district. The Chairman (Mr. W. T. Cooper) said Marshall's No. 3 was badly affected with rust this season. Wheat after oats yielded well. Members generally agreed that the present method of marketing grain could be considerably improved.

GREEN PATCH (Average annual rainfall. 26·56in.).

February 9th.—Present: 10 members.

HARVEST RESULTS.—Members reported the results of the season's harvest. Mr. P. Sinclair had secured highest yields from land on which he had used no super. Mr. Sage's crops were very poor. Mr. T. Murray secured a two-ton oaten hay return from fallow, and 53bush. oats per acre. Malting barley yielded 25bush. per acre on fallow and 18bush. on green-ploughed land. From yacca land, a sandy loam, Mr. Venning obtained nearly two tons of hay per acre on fallow, the returns from which in every case were much higher than those on green-ploughed land. With the crops of the Hon. Secretary (Mr. C. J. Whillas) the position was reversed, the green ploughing returning more than the fallow. Barley yielded 12bush. per acre. He had sown kale with some of the hay. It grew well, but it spoiled the chaff sample for sale purposes, and dulled the chaffcutter blades very quickly. It gave a fair amount of feed, however.

PETINA (Average annual rainfall, 13·19in.).

November 1st.—Present: five members.

FARM TOOLS.—Mr. F. Goodhart read the following paper:—"A few pounds spent on tools when starting a farm will never be regretted. We look first at the man who does not buy the necessary tools for his work. He starts out in the morning to do some fencing, remembers he has no crowbar, and has to go to his neighbors; that means an hour or two before he gets to his job. Then we see him trying to fix up some machinery repairs. Maybe he is hacking away at a piece of wood with a cold chisel and screw spanner instead of a wood one and a mallet. Again, we see him trying to cut wire netting with an old axe and the same screw spanner; the latter having to do duty for a hammer at all times. We watch again as he goes to yoke up his horses; he has to make holes in his harness with a penknife, thus spoiling his straps, which, as soon as they begin to perish with age, break and have to be renewed. We see him again in the field trying to cover up his rabbit holes with an old spade with a mallee handle, which comes off every now and then. Thus all through the week he has delay after delay, wondering why he does not get as much done as his neighbor, although he always works longer. We watch the neighbor. He has a good stock of tools. He goes to the shed, picks up the crowbar and spade, perhaps oils the handle before going out, and sets to work immediately. There is no screw spanner used for hammer here, or cold chisel for wood chisel, or axe for snips when cutting wire netting. He has his tool-box and knows where to find his tools, and when the job is finished things are put back ready for next time. So through the week all goes well and he is well pleased with the work done Tools are too often left to take care of themselves, thrown down anywhere, left exposed to weather, and put away broken and useless. All tools should have their proper place in the shed. Handles should be oiled now and then, and broken ones repaired. A most important thing is to keep tools sharp. We might just as well have a cold chisel as a very blunt wood one when cutting wood. An axe chipped and blunt is next door to useless to the man who likes to see the chips fly; to saw a piece of wood with the saw found on most farms would make a carpenter's hair go grey. So we see, besides having a stock of tools we must have a place for them and keep them in good order. To mention a few most useful tools for the beginner: There is the axe—one does not need to say much about its uses, but if the handles were well oiled as soon as they were bought, and kept oiled, there would be fewer broken ones. I would recommend a long handled round-nose shovel for general use; when we can afford them, a short handled round and square nose tool will be useful. The crowbar, which is one of the most useful tools, should be fairly light, but strong, about ⅞in. hexagon steel. If the bar were used more most people would have fewer rabbits, as I find a warren that has been well barred up in the summer time is seldom opened, and is quite safe for the horses to go over. There is not much use for the pick, except in tank-making. The mattock is useful for shoot-cutting, trimming the sides of tank walls, &c. We need at least two hay forks, one long and the other short. A manure fork is also useful. A very good chaff fork can be made out of a piece of 3in. x 2in. oregon and a few pieces of deal for prongs, and a pine handle; this is invaluable where the cocky chaff is saved. A few carpenter's tools are a great help. Hammers, saw, wood chisel, brace and bits, and plane will be found most necessary. A pair of plyers, snips, and a leather punch are very useful. The last-named will save the harness from going to pieces, as it is useful when mending. When funds will permit a small forge, grindstone, and a few blacksmith's tools can be bought. A cheap portable forge can be had for £2 10s., small, but very useful for sharpening tools, &c. A small vice is necessary. A set of stocks and dies and soldering tools are also invaluable to the man who knows how to use them."

Scrub-Rolling.—Mr. W. S. O'Grady read a paper. He regarded the axe as a primitive and time-wasting method of clearing scrub, and said—"The surest and cheapest means of getting a good lump of scrub down in the right time is a good scrub roller. I prefer an old steam boiler, which should be at least 4ft. 6in. or 5ft. in diameter and 8ft. or 10ft. wide, mounted by a good solid frame, strongly iron bound. Care should be taken to see that the pole is of good length. Such a roller should not cost more than £40 or £50, and be a first-class investment on a scrub block, and quite as important as a stripper or plough. Eight horses, two abreast, or nine, three abreast would work it comfortably, and roll from 10 to 20 acres per day. Timber up to 4in. or 5in. in diameter can be rolled with the assistance of one good axeman easing or nicking the biggest trees. Larger stuff can be rolled, in fact anything that the horses and roller can comfortably be got over when down if a sufficient amount of nicking is done. Average sized scrub is not very troublesome to get over with a team, as a good heavy roller crushes it flat. Some people have an impression that rolled scrub is difficult to burn. Such is not my experience, in fact quite the contrary. This is also borne out by the experience of others who practise rolling, and whom I have questioned on the matter. The earlier in the winter that the scrub can be got down the better will be the ensuing crop; early rolling or chopping the scrub acts something like fallow to the land. Providing it would burn as well, I should prefer scrub cut or rolled for two seasons before being burned. The fire would then kill a lot of the shoots and also burn out a lot of stumps. The land would also improve by lying under the dead scrub. There are thousands of acres of scrub on the coast that can be rolled, even if in some places it is necessary to dodge the heaviest patches and the fringe of plains. One acre of cleared scrub land—on the coast—is worth two or three of the plain for growing either grain or feed. I would strongly advise anyone with a scrub block to procure a roller and give it a trial, commencing on the smallest stuff. Care should be exercised to get the scrub burned before the best of the burning season is over, during February for preference.

ROBERTS AND VERRAN.

February 10th.—Present: nine members and one visitor.

Sheep-Farming.—Mr. J. A. Buttfield read a paper on this subject. In this district he would select ewes locally and cross them with well-bred rams, Lincoln or Shropshire. Ewes should be sold before they lost value through age or loss of teeth. When teeth were missing they could not chew the food properly, and the digestion and assimilation were imperfectly performed. This rendered feeding an expensive matter, and the animal was unprofitable. When purchasing ewes, it should be seen that they were two, four, or six-toothed. Small farmers could sell all their sheep when fat and purchase fresh stock between the middle of September and the end of October, and mate these five months before the lambs were desired. On arable land, the flock should be folded off with hurdles or netted upon such crops as clover, vetches, rape, mustard, turnips, swedes, and sometimes rye and other growing corn. On mixed farms sheep should have constant change of pasture, and the pasture should from time to time be chain harrowed. In the spring the sheep should be fed on the young grass. In summer, vetches and clover might be used and cabbages in the autumn. The flock should be fed liberally, but never to excess. By the constant change of pasture the animals' health and appetite, and power to assimilate food, were kept at their best, while the change was beneficial to the pasture itself. The feeding and care of animals had not reached a final stage, and improvement in this matter, as in others, was to be looked for. When buying a sheep, the purchaser should be satisfied on three points, viz.—(1) That the age given by the seller was correct; (2) that the feet were sound; and (3) that the skin was healthy. In the discussion which followed, Mr. F. Masters thought no farm was complete without sheep, but in this district it was necessary to wait a year or two to get enough feed to carry a large flock. For wool and mutton he advocated the half-bred Merino. The capital laid out in buying sheep could always be realised. Mr. McCallum had kept pure Merino for wool, but suggested a cross for lamb-raising. Young ewes for breeding and export lambs for freezing, if dropped in May, required most feed at the time when it was most plentiful. Ewes fattened more quickly on dry feed, if in lamb. Lambs should be fit for market in five months.

KOPPIO, February 12th.—Manurial Tests.—Mr. J. Newell supplied the results of some experiments he had conducted. Three plots, each a quarter of an acre in area, were fallowed about the middle of September, 1912, and cultivated before the drill; 2bush. of Calcutta Cape oats per acre were drilled in on April 29th, 1913, and the land harrowed after the drill. On plot 1, 210lbs. of mineral super. per acre were drilled in immediately after fallowing, and 90lbs. per acre with the seed. Result—124 sheaves of hay, averaging 8lbs. each. On plot 2, 90lbs. of mineral super. per acre was drilled in with the seed. Result—119 sheaves hay. On plot 3, 300lbs. of mineral super. per acre was drilled in with the seed. Result—133 sheaves hay. Valuing super. at £4 10s. per ton, seed at 2s. per bushel, and hay at 70s. per ton, the results per acre were as follows:—Plot 1, £4 16s.; plot 2, £4 19s. 4d.; plot 3, £5 5s.

MILTALIE, February 7th.—Best Wheats for District.—The Chairman (Mr. P. G. Wilson) had secured best returns from Yandilla King and J4 varieties. Mr. W. G. Smith did best with Gluyas and Federation, and Mr. J. P. Storey with Federation and Marshall's No. 3. Mr. H. R. Jacobs obtained the heaviest grain returns from Silver King and Golden Drop, and Le Huguenot yielded 2 tons of hay per acre.

UTERA PLAINS, February 14th.—Handling Wheat in Bulk.—Mr. M. Abrook read a paper on this subject, written by Mr. H. Dolling, of the Pine Forest Branch, and printed on page 686 of the January issue. After discussing this paper it was decided that the elevator system was not workable in South Australia.

YABMANA, February 7th.—Farm Management.—A paper read before the Inman Valley Branch on this subject was read by Mr. A. Robertson, and discussed by members. Mr. Beinke said a good income could be secured from such sidelines as sheep, pigs, cows, and poultry, if they were properly managed. Labor was too expensive to employ on the farm.

Co-operative Ownership of Stallions.—The advisableness of purchasing a stallion for the use of members was discussed. It was thought that better all-round satisfaction would be secured from a privately-owned animal. A little work was necessary for a stallion, but he should be allowed time in which to pick up condition before commencing the season.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

COOMANDOOK (Average annual rainfall, 18·01in.).
February 7th.—Present: 10 members.

Destroying Mallee Shoots.—Mr. W. Brown read a paper. He advised ploughing out the roots and burning the stubble. A four-furrow implement, high enough to clear stumps, and with plenty of room between the mouldboards and the land wheel should be used. Fallowing should be commenced immediately after seeding was completed, every advantage being taken of the saturated condition of the land during winter The ploughing should be to a depth of 4in. A disc implement was very good for working back, as it would cut off a large number of shoots. The stubble should be fired immediately after the stripper. A better burn was secured in oat stubble than in wheat.

Mr. Williams also read a paper. Rolling should be done, he said, about October. A fire could then be started early in February, which would destroy the dry mallee, and any shoots that had developed in the meantime If two good stubble burns followed on the scrub burn, 95 per cent. of the shoots would be destroyed. Another method was to drag out the roots with a four-furrow plough; the success of this depended largely on the nature of the ground. Members generally preferred the latter method; and advised "dragging" the stubble before fire-raking.

MONTEITH (Average annual rainfall, 14in. to 15in.).

February 13th.—Present: 12 members and six visitors.

Irrigating Reclaimed Swamps.—The Chairman (Mr. D. Travers) contributed the following paper on this subject:—"All water should be put over the surface. The land is very porous, and the faster the watering is done the less waste will occur. The main channel must be deep enough to carry the whole of the water supplied by the sluice through the higher portion of the land. Weeds must not be allowed to grow in this. The land should be graded. Levels should be taken by putting holes down to the water level 2 chains apart each way. Pegs should be marked with a saw cut an equal distance from the top and pressed into the holes until the saw cut reaches the water. The tops of the pegs will then correspond with the water level. Should more pegs be required, they may be driven in and sighted along those previously put into position. Then proceed to measure from the tops of the pegs to the ground. Add all measurements together and divide by the number of pegs used. This will give the average of the paddock. The buckscraper is the best implement to use. A wooden drag, not less than 16ft. in length, should be put over the land to give it a smooth surface. When grading is finished, the paddock should be divided into small areas. Checkbanks should be put across the piece to hold the water back. These should be not more than 3 chains apart, as one can water much more quickly in small pieces. Inexpensive but effective gates should be erected at each of the stops, and on no account should any banks be on the channel, as the water should overflow the channel the whole distance of the piece being watered. The greater the outlet given the faster the water will come down through the higher portion. By this system the land can be flooded at the rate of 2 acres per hour with a fair river, and the desired results can be accomplished with one-third of the water used by any other system which I have yet seen. It behoves each settler to make the best use of the water, as it has all to be pumped, which is costly. The careless use of water makes it difficult to keep it down on the flat. There is nothing more detrimental than to allow the water to rise too close to the surface. In all cases drainage should be the first consideration." Members agreed with the views expressed in the paper.

WILKAWATT (Average annual rainfall, 16in. to 17in.).

February 7th.—Present: 17 members and four visitors.

Oats.—A short paper on this subject was read by Mr. A. J. McAvaney. Whilst there was more trouble involved in harvesting this crop, he said, it would pay farmers in this district to grow more oats. The stubble made good feed, and oats with chaffed hay fed to horses provided an excellent ration. They should be sown early in April. The Algerian variety was the best. The land should be worked well. Mr. M. Neville found that Cape oats stood up better than Algerian, and grew just as heavy a crop. He had secured up to 30bush. per acre.

BERRI.—**Demonstration Plots.**—A committee, consisting of Messrs. F. Arndt, T. L. Hughes, A. P. Wishart, R. Staehling, and W. R. Lewis, was appointed to supervise experimental and demonstration plots to be carried out by the Branch.

COONALPYN, February 6th.—**Miscellaneous Evening.**—The evening was devoted to the consideration of miscellaneous items of interest. Mr. Gurner thought it a mistake to put rock salt in the horses' mangers; it should be placed in a separate box in the yard. Mr R. F. Venning said an old bag hung on a barbed wire panel might frequently prevent an accident. Mr. G. E. Venning recommended an application of equal parts of vinegar and salt to snake bites. Horses which had eaten wheat should be given two dessert-spoonfuls of carbonate of soda, in the opinion of Mr. Bone. Mr. Pitman said eucalyptus applied to old bolts would be of considerable assistance in removing the nuts.

MONARTO SOUTH, February 7th.—Wheat Samples.—Members tabled a number of samples of wheat, which were found to vary in weight between 54lbs. and 68lbs. per bushel.

WAIKERIE, February 9th.—Harvest, Etc—Weather during the month of January had been hot and windy, the rainfall being 18 points. Washington Navel oranges fell badly, hence the crop was poor. There was promise of a fair average crop of common oranges, but mandarins were light. The crop of stone fruits had been very good, but the fruit, especially peaches, was on the small side. The vines promised a record yield. Wheat was brought on well by the late rains, but results were considerably affected by the hot winds.

SOUTH AND HILLS DISTRICT.

MEADOWS (Average annual rainfall, 35·32in.)

January 13th.—Present: 10 members and one visitor.

Working Light Soils in Meadows District.—Mr. W. Phillips read the following paper on this subject:—"In working the lighter soil of this district, that which is commonly called the 'poorer soil,' I have found that it is a mistake to bring it to too fine a tilth. When we get heavy winter rains the soil runs together and becomes waterlogged, and in the summer it becomes hard. The best plan is to plough the land as soon as the crop is off the field. If it is intended to grow another crop of hay on the same land, the first crop of hay should be cut on the green side. If land is summer-ploughed and allowed to lie open, fully 60 per cent. of the sorrel thereon will be destroyed. After a crop of peas, and when the land is clean, it is advisable to cultivate it both ways and allow it to remain until the last week in April, then cultivate, drill across it, and harrow. I advise ploughing deep (5in.) for peas and shallow (3½in. or 4in.) for hay. Our holdings are too small for us to allow the land to lie idle in fallow for 12 months. Crops on the lighter soils will stand a wet winter better if the land is ploughed early in January and left in the furrow. This will allow the subsoil to dry and crack, and when the heavy winter rains fall the land will absorb more water without becoming waterlogged. Decaying roots also assist in drainage. I have a small paddock near the homestead in which, three years ago, I put 3bush. of peas and 2cwts. of bonedust to the acre. After the peas were cut and carted off I put the cultivator over the land twice, and allowed it to lie out for three months. Then I cultivated it again before the drill and sowed 3bush. of White Tuscan wheat on one and a half acres, and 6½bush. of Algerian oats on two and a half acres, two bags of super. B. being put on the four acres. I cut the lot for hay on the green side and carted 15 loads of hay out of the paddock. I ploughed the land as soon as the hay was out of the paddock, let it lie till the end of April, then cultivated it and drilled in the same quantity of seed on the same ground. I put 150lbs. of wheat manure with the wheat and two bags of super. B. with the oats. It cut 16 two-horse trolley loads of hay. Three years ago this paddock was badly infested with sorrel, and now it is the cleanest on the farm. I attribute this to summer ploughing. If we keep putting the same manures in the ground year after year, we will find the land becoming stale or sick, and deficient in other plant food. I consider bonedust the best all-round manure. This will last longer in the ground than any other. Of course, stable manure must have the pride of place, but the trouble is, we cannot get enough of it. I have tried bonedust, bone super., bone manure. super. B., guano super., and S.A. super., and got good results from all, except S.A. super., which, in my opinion, leaches too quickly in this district." In the discussion which followed, the Chairman (Mr. Geo. Ellis) said that a paddock in which sorrel was troublesome should lie out for a year or two, and be fed down with sheep before being ploughed. He cultivated a paddock last year after a pea crop, but the subsequent crop was not a success, the hay being light and patchy. He considered that the land in this district needed ploughing each time a crop was sown. Mr. G. T. Griggs was also of the opinion that it was best to feed the sorrel down with sheep. Mr. A. L. Ellis said that if new ground were only cultivated chips and sticks would be brought to the surface, which made binding difficult. These were buried by the plough.

MORPHETT VALE (Average annual rainfall, 23·32in.).

February 17th.—Present: 12 members and three visitors.

Fodder Crops and Stock.—Mr. H. V. Sprigg read the following paper:—"The production of meat on the farm is not receiving the attention it deserves. It is certainly the best paying 'crop' we can grow; it pays not only in cash, but also by the improvement it makes to the soil. Of all farm products, meat is the one for which the demand is steadily and surely gaining on the supply. Countries like North America, from being large exporters, are becoming importers; Germany and other European countries are being forced by the demand for meat to import. This all goes to show that in the future there will be a strong market, at good prices, for all the meat we can raise—modern freezing methods of export putting it on the world's markets in excellent condition. Our climatic conditions and soil are pre-eminently fitted for mixed farming; yet up to the present we have practically devoted the whole of our energies and cultivation to hay and cereal production. Hay has been a paying crop, but it must be remembered, this has been due to the export trade, and now all the States, except Queensland, are prepared, and probably always will be, to export. The position is changed. Even on top of three indifferent harvests, the price is not great; what then will be the position on top of good harvests? Again, at the price of our land I doubt if we can produce cereals only at a profit. The present price of barley and oats, for instance, is not cheering, and yet we must grow them as rotation crops if we wish to give our land a chance. With prospects of over production in the hay market, and selling our cereals in the world's markets, in open competition with the product of countries of higher yields, or cheaper production, the right course for us to adopt is to turn as much as possible of our farm products into meat, thereby selling them at a higher price in a form that our climatic conditions enable us to produce at a cheaper cost than any other country. These advantages are not fully realised. In Northern Europe and North America, for instance, the stock have to be stabled and hand fed during the winter in most parts, and a larger proportion of the food is consumed in animal heat. Yet we find, then, that farmers devote a large part of their labor and land to growing in rotation fodder, root, and grain crops, and also buy concentrated stock food for producing meat. Here, if our stock is given good natural shelter and plenty of food and water, we can fatten them in the open all the year round. It is not necessary for us to expend capital and labor in housing and hand-feeding, but it is necessary for us to devote labor and land to growing feeding crops in rotation for fattening purposes, if we are to get the best return from our farms. The foregoing remarks apply equally to all classes of meat-producing stock, and the particular class a farmer utilises will depend on his individual preference, and on the climatic and soil conditions of his holding. I intend to restrict my remarks to sheep, as I consider them best fitted, both to mixed farming and climate in this district, as they poach or puddle the land less in wet weather, and are easier to manage and market. The principal factors to be considered in mixed farming with sheep as a leading line, are good fences, small paddocks, water, shelter, and a rotation of fodder crops; these will now be discussed in turn. Good sheep-proof fencing is essential. All our old wire fences are useless for sheep; even a good so-called sheep-proof wire fence only makes rogues of the sheep. Wire netting makes the most effective fencing. The cost is much over-estimated, heavy gauge netting and rabbit-proof mesh are quite unnecessary here. No. 18 gauge, 2ft. wide and 3in. mesh, is ample. but it is absolutely necessary to have a wire top and bottom and the netting well secured to them. This netting costs £8 per mile. A good new fence can be erected as follows:—Posts 5ft. 3in. long, half a chain apart, with three T iron standards 4ft. 9in. long. The hole for the top wire for the netting is punched 1ft. 3in. from the top and the two holes above 7in. apart. This leaves the top hole 1in. from the top of the standard, which is notched to take barb wire. In the posts the hole for the top wire for netting is bored 2ft. 4in. from the ground; the next 7in. above, and for fastening barb wire, 3in. below the top. The bottom wire is not put through the posts or standards, being simply laid along the ground and tied to them. No. 10 wire is sufficient for the top and bottom of the netting, No. 8 for intermediate, and a barb for the top. This gives a fence 3ft. 6in. high, with 8in. and 7in. between the top wires, which prevents large stock feeding between them, that being the cause of the most serious damage to fences. When the netting is stretched and tied between the two wires it will cover 2ft. 3in., leaving the bottom about 1in. from the ground. Old four and five-wire fences can be made sheep-proof by running the netting along them, but a wire must be put at the bottom and tied to the posts at intervals. It is essential that the netting is only tied at the top and bottom, if tied in between it will twist and crumple. This will cost about £11 per 80-acre section. *Small Paddocks.*—By small is meant paddocks proportionate to the flock and farm from, say, a seventh to a twelfth of the total area. This is necessary to allow a rotation of crops and to get the highest feeding value from the land. A given area of grass land will, if divided into three or four parts, carry about a third more sheep than if they are given the run of the whole. When feed is plentiful they simply pick the tit-bits and let the rest grow rank and unpalatable; whereas if it is fed in sections in rotation they will clean up each paddock, and have constant change and fresh growth. There will be more growth, the grass will be longer running to seed, and the pastures will be clean. *Water.*—Good clean healthy stock water is one of the most important factors in fattening. The stomachs of the sheep are much better judges of when they require water than the head of the owner. One of the greatest difficulties is to so arrange the paddocks that water is available in each. On stubbles and dry feed, especially peas, sheep will drink several times a day, and to fatten they must have it; the moral is to have plenty of troughing and keep it full. Shelter, especially shade in summer, is worth a lot of feed and water. When they have it they will camp contentedly during the heat, chewing the cud and putting on flesh, otherwise they will be panting, blowing, restless, and wasting. Where there is natural shelter of trees and undulating ground, this is quite sufficient, but where these are absent it will pay every sheepowner to erect artificial shelter. It may be assumed that all farmers theoretically admit the value of rotation of crops, even those who, for various reasons, give no practical expression to it. The main reason for its omission is the custom of selling the whole of the produce off the farm, consequently cultivation has been restricted to hay, and those grains for which a ready market has been found. That is probably the reason practically nothing but cereals has been produced here for the last 60 or 70 years. We really know little of the possibilities in other directions, and that little resting on sporadic experiments, which have often been classed as failures, without inquiring into the why and wherefore, or even the conditions necessary to ensure success. Similar failures take place every year in our cereal crops, but we do not argue that the district is unsuitable for cereals. The time has now come when we should make a strong, resolute, and united effort to solve this question, and prove, as I am sure we will, that this district can grow fodders all the year round. The value of peas as a feeding crop is so well known that little need be said about them. The only disadvantage is that early summer rains cause them to shoot, making it advisable to feed them quickly. Last season I mixed 1bush. peas, ½bush. each oats and barley, 4lbs. rape, and 1lb. mustard. I have already fattened 10 sheep to the acre on this, the rape has been fed off twice, and with early rains I expect to have good winter feed from it. Dwarf Essex rape is best on the lighter soils, and the tall variety, or thousand headed kale, for heavy lands. The best way to sow small seeds is to mix them with the manure. They should be mixed in the drill as required, not any length of time before using. Next month I intend disking some barley and hay stubble and sowing it with a mixture of rape, kale, mustard, clover, lucerne, melilotus, and grass seed. As to what grasses will give the best results we have very little knowledge, but the best guide is to take those that are now growing here. Although I have had little success with lucerne, I think it is due to the method of treatment rather than climatic or soil conditions. The sample tabled shows what can be done without irrigation, and in a railway cutting the roots are down over 15ft. Other fodder plants that should be tried are field beans, cow peas, soya bean, lupins, and vetches. At Wagga Wagga cow peas, sown in November, give good green feed during the summer. They must be sown after the frosts. They stand the dry weather well. This crop and Japanese millet both do well here. There are, of course, maize and sorghum, but I am only dealing with plants capable of being fed off in the green state or harvested by sheep. Another scheme I intend to try is fattening sheep on pasture with barley and chaff. A recognised ration for fattening sheep on pasture is ½lb. of cotton cake and ½lb. of linseed cake. The feeding value of cotton cake and barley is about the same; linseed cake we can take at, say, double the value of hay chaff. Consequently a ration of ½lb. of barley and 2lbs. chaff will be about 30 per cent. higher than the standard ration. Barley at 2s. 1d. per bushel is ½d. per pound, and hay at £2 6s. 8d. is ¼d. per pound, so the cost of the ration is 1d. Sheep will put on ½lb. to ¾lb. per day; this, at present market price, is 2d., equalling 100 per cent. on cost of ration, for pasture, marketing, and profit. There is no reason why we should not turn our grain and hay into meat when the prices are low. I am confident that if farmers devoted a portion of the land they have under bare fallow to fodder crops it would net a higher cash return, besides improving the fertility, enhancing the value of the farms, and increasing the production of the district. Now, great as are the benefits we derive from the Bureau, I feel we are not making the most of them. We want more practical work in testing and putting theories into practice. Remember that the theories of to-day may be the practice of tomorrow, so let each of us do his little towards solving some agricultural problem. Let us each decide to make some test, some experiment, it does not matter how small, under ordinary farm conditions. Although no general deduction can be drawn from an individual case, yet much useful information may be gained, and a way discovered, each case being laid before this Branch and discussed as it matures. Let us show that we have confidence in our district, and set an example to other Branches in this matter of fodder-growing for meat production."

BLACKWOOD, February 9th.—Poultry Housing and Feeding.—An interesting and instructive lecture on poultry housing and feeding was delivered by the Poultry Expert, Mr. D. F. Laurie. The lecture was illustrated by means of models and diagrams, and at the conclusion numerous questions were answered by the speaker.

CHERRY GARDENS, February 10th—Mr. L. C. Dobbie delivered a lecture and exhibited a collection of lantern views of Queensland, prepared by the Tourist Bureau of that State.

HARTLEY, February 11th.—Harvest Results.—Members exhibited samples of this season's crops. In many cases the grain was somewhat pinched, on account of rust and dry weather. Two or three hot days when the wheat was filling caused the wheat to dry off quickly. The average returns of wheat were from 3bush. to 16bush. per acre. Oats were of a very good sample in most cases. The yield averaged from 10bush. to 30bush. per acre.

IRONBANK, February 5th.—The Horse.—A short paper dealing with the horse and its management was read by the Hon. Secretary (Mr. W. H. R. Coats). The animal should be well fed and stabled, he said, and the driver should carefully study its temper On no account should it be forced when tired. The whip was unnecessary. Mr. W. Slater disagreed with the last statement.

Demonstration Work.—Mr. Slater undertook to test the effect of applications of nitrate of soda to land.

LONGWOOD, February 7th.—The meeting was held at the homestead of Mr. H. Winter. The orchard was inspected, and a striking tribute was paid to the value of thorough cultivation by the clean and healthy appearance of the fruit trees.

Government Experimental Orchard.—The Hon. Secretary (Mr. J. R. Coles) reported on the Branch's visit to the Coromandel Valley Experimental Orchard. He paid a tribute to the good work being done there.

MOUNT BARKER, February 11th.—Annual Social Gathering.—Fifty-five members and about 100 visitors sat down to a banquet arranged in the Town Hall by the ladies. After necessary Branch business had been dealt with and justice done to the excellent fare, several toasts were honored. The speakers were the Chairman (Mr. Harry Bell) Mr. A. M. Dawkins (ex-Chairman of the Advisory Board), Mr. G. G. Nicholls (Secretary), Mr. Bert Fidler, Messrs. Scrymgour and Dumas. Several new members were enrolled. A high tribute was paid to the fine work of the Secretary, Mr. J. E. Smith, B.Sc. The function proved a thorough success, and was in itself striking evidence of the popularity and worth of the Bureau in the Mount Barker district.

MOUNT PLEASANT, February 14th.—Crop and Stock Reports—The crops were reported to have been disappointing in this district, owing to the prevalence of red rust and hot winds. Stock were falling away in condition.

Camel Team, Oodnadatta.

AGRICULTURAL PUBLICATIONS.

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

Vinegrowers' Manual, by A. Sutherland, 6d.; posted, 7d.

Reports of Conferences of Australasian Fruitgrowers held at Brisbane and Wellington, 1s. each, or 1s. 1d. if posted.

Journal of Department of Agriculture of South Australia, 1s. per annum in advance; 3d. per single copy to residents of South Australia; 2s. 6d. per annum to other places.

Any of the following Bulletins and Leaflets may be obtained by sending a penny stamp for postage:—

Agriculture, Miscellaneous: Agricultural Bureau Congress Reports; Amount of Spirits to be Extracted from a Ton of Raisins; Depth of Sowing some Agricultural Seeds; Digestibility and Handling of Wheaten Hay; Dry-Farming Conference Reports; Feeding-Off Experiments with Sheep; Housebuilding in New Districts; Irish Potato Blight; Lucerne Cultivation and Management; Lucerne Leaf-Spot Disease; Milling Experiments; Reclamation of Land; Roseworthy College Farm Flocks; Roseworthy College Harvest Reports; Roseworthy College Experimental Field Reports; Sheep on the Farm; Spraying against Potato Blight; Stage to Cut Wheaten Hay; Trial of Stone-Gathering Machines.

Horticulture: Banded Pumpkin Beetle; Bordeaux Mixture; Curculio Beetle; Codlin Moth; Currant Industry; Fertilisation of Orchard Lands; Fruit Drying; Fruit Flies; Fruit Preserving; Grape Vine Mildews; Gumming Disease of Peach and Almond Trees; Selection and Planting of Fruit Trees; Peach Leaf Curl Fungus; Plums and Prunes; Preserving, Canning, and Drying of Fruits; Production of Early Tomatoes; Remedies for Diseases of Fruit Trees and Vines; Some Notes on Almonds.

Dairy: Milking of Cows; Spaying of Cows: Taints and Flavors of Dairy Produce; Taints in Milk and its Product; Testing Milk and Cream.

Stock: Branding of Stock; Bot Flies and Bots; Castration of Colts and Spaying of Cows.

Poultry: Diseases of Poultry; Parasites of Poultry; Poultry Tick; Reports of the Egg-Laying Competitions; Single Testing for Egg Production.

Beekeeping Notes.

[Every farmer and fruitgrower should join the Agricultural Bureau. Write to Department of Agriculture for particulars.]

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T. PASCOE,
Minister of Agriculture.

POINTS FOR PRODUCERS.

Farmers' Conference.

The Annual Conference of the Northern Yorke Peninsula Branches of the Agricultural Bureau is to be held at Kadina Town Hall on Friday, April 17th. The speakers include the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), who will open the Conference, the Director of Agriculture (Mr. Wm. Lowrie, M.A., B.Sc.), Mr. F. E. Place, B.V.Sc., M.R.C.V.S. (Government Veterinary Lecturer), members of the Advisory Board, and others. Sessions will be at 11 a.m., 3 p.m., and 8 p.m. Papers from district Branches will be read and discussions will follow each. The meetings are open to the public, and it is anticipated that a large number of farmers will attend.

African Box Thorn.

The attention of landholders is directed to the fact that in certain parts of the south the African box thorn (*Lycium chinense*, Mill.) is liable to cause considerable trouble. The district council of Port Elliot applied to have the plant proclaimed under the Noxious Weeds Act, and stated, *inter alia*, that in that district a great deal of land had been appropriated by the box thorn, and it was now the worst of all weeds. Birds carried the seeds all over the country, and the result now was that thousands of acres of land would be utterly useless to stockbreeders unless much money was spent in rooting the box thorn up. According to a paragraph appearing in a Western Australian paper the Government of that State have recently gazetted the box-thorn as a noxious weed.

Pruning Almond and Prune Trees.

A writer in the *Pacific Rural Press* discusses the question of pruning or non-pruning of almond and prune trees. He gives some interesting information as to the results obtained from cutting back almonds of the Hatch varieties for the purpose of grafting in other varieties. In some cases the grafts failed to take, but the shoots from the stub, which were, of course, from the Hatch varieties, bore finely in a way that left all the old wood out of the running. Apparently the advantages were not with the grafting in of new varieties, but the sending out of new wood. The writer concludes—"In almost every instance prune or almond growers who have reason for dissatisfaction could well experiment in a little more vigorous pruning and shortening back; if they have lots of water sprouts in their orchard and not even an excuse for them, they are hopeless if they do not even cut them out."

Feeding Value of Grain Sorghums.

In the course of some interesting comment on the growing of sorghums Professor O. O. Churchill, Agronomist of the Oklahoma College of Agriculture, states—" In feeding value the grain of the different grain sorghums will run about nine-tenths of that of corn. Ten bushels of Kafir, milo, or feterita is equal to 9bush. of corn for fattening purposes. If the grain is ground there is probably very little, if any, difference in feeding value between the different varieties. There is, however, a difference in the hardness of the different seeds, and hence there may be a slight difference in the feeding value when the grain is fed without grinding. It is just as easy to put stock in good condition for the market by feeding Kafir and milo as it is by feeding corn. Such feed, if fed exclusively and in large quantities, may produce harmful effects on the animal's digestive system. It is well, therefore, to feed a mixed ration."

Migration from English Rural Districts.

Giving evidence before the Dominions Royal Commission, Mr. R. H. Rew, C.B., Assistant Secretary to the British Board of Agriculture, said that some of the board's correspondents in the country had complained of the activity of the emigration agents, and he declared that if the present rate of emigration continues it will not be a good thing for English agriculture. There was, he said, no surplus of agricultural laborers—certainly none to spare for emigration ; and he agreed that it was not in the interests of the Mother Country to be stripped of its workers for the benefit of the Colonies in this way. Referring, says the *Agricultural Gazette*, to the report of the board on migration from rural districts, he stated that its general tenor was that there was a moderate deficiency of labor in agricultural districts, which was undesirable from the point of view of the farmer. On the other hand, an over-supply was, of course, not good for the laborer. If emigration to the colonies did not exist, it was probable that there would have been a larger migration from the country to the towns. The board's correspondents had put it almost as a complaint that the emigration agents had been particularly active in endeavoring to persuade farm laborers to accept the rather tempting offers made to them to emigrate.

Rural Education.

Dr. E. J. Russell (Rothamsted Experimental Station), speaking on the question of rural education at a Conference of the Teachers' Guild of Great Britain and Ireland, said that it should be remembered by the educationalist that the countryman's outlook on life was essentially different from that of the townsman. The average town boy grew up to be very much of a specialist and was drilled more or less into obedience to a system, the country boy had specially to develop self-reliance and to learn how to see a thing through once it was begun. This self-sufficiency made the country boy a magnificent colonist, but it also made him wholly averse from submitting himself to a system. Another distinction lay in the nature of relaxations possible after a day's work. In the day the countryman could entertain himself satisfactorily, but his ingenuity in this respect often vanished with the daylight. Education should enable him to do for his leisured hours what the training at his work enabled him to do during his hours of labor. The system of rural education must also recognise that the boy's life would be spent in the most intimate contact with nature, and it must admit of variation.

Siberian Butter and Cheese.

In the course of an interesting despatch on the growing importance of the Siberian Dairy Industry, the St. Petersburg correspondent of the *Daily Telegraph* states that the turnover of the union of West Siberian butter-farming artels, which in 1912 was 7,000,000 roubles, was more than doubled last year (1913) to 14,500,000 roubles. It embraces 563 different butter-making associations, with 502 depôts. The net profits of the union amount to 120,000 roubles. It is interesting to note that the first experiment of producing Siberian " Cheddar " cheese for the English market was made in 1912, but the result was not brilliant. The cheese turned out rather coarse, and not like the genuine article. The union promptly sent an expert to England to study cheese-making processes on the spot, and last year the result was so far satisfactory that about 65 tons of Siberian Cheddar cheese were sent to England. Siberian dairy and peasant farmers find that while there appears to be an over-production of butter for the European markets, there is a great want of cheese, and therefore they propose to devote particular attention to the development of this branch for the benefit of the British markets. The union has already acquired its own steamers and barges on the River Obi, and expects to receive considerable financial assistance from London.

Effect of Metals on Flavor of Butter.

The effect which the presence of minute quantities of iron or copper may have on the flavor of butter has been the subject of investigation by the experts of the Dairy Section of the United States Agricultural Department. "According to their report," says the *Mark Lane Express*, "very small amounts of these metals in the cream cause certain undesirable flavors to increase in intensity during storage. These flavors are often designated as 'metallic,' 'oily,' or 'fishy.' Experiments were carried out using known quantities varying from 1 to 500 parts to a million parts of cream. The butter was stored and examined at intervals varying from 20 to 187 days. The most noticeable feature was the rapid development of bad flavors in the butter containing the iron. Butter made from cream which had stood in rusty cans developed a peculiar taste easily picked out. The influence of copper was even more marked than that of iron. The work shows that if cream is kept in rusty cans or comes in contact with iron or copper during the process of butter making, it may take up iron or copper from rusty cans, exposed bolt heads, or other metal parts of pasteurisers or churns, in sufficient quantity to affect the flavor of storage butter. While there is nothing to show that the nature of the flavor is appreciably changed, it does demonstrate very clearly that the rate of development of the undesirable flavor is greatly accelerated during storage by very small quantities of iron or copper."

Intensive Cultivation.

The problem of successful farming nowadays, and particularly the problem of small holdings, must depend for its solution on intensive culture; which means that the crops grown one after the other in quick succession must be sown in soil worked into a condition as perfect as possible, and must be regularly nourished with ample supplies of available plant food. If horses are put to extra hard work they are supplied with extra rations, including energy-producing grain ; similarly the soil, if expected to produce a quick succession of exhausting crops, must be supplied with the nourishing material to enable it to bear with success the strain.—*Agricultural Gazette.*

Selling Crops or Keeping Stock.

Of course the farmer must sell something to make his profits, but is it better for him to dispose of his products in the shape of hay, straw, corn, and roots as they are, or in the form of beef, mutton, pork, milk, &c., produced by the crops grown on the land ? It is a question of selling the crops to the stock on the farm rather than to an outside purchaser, and the point is, which will pay the best price in the long run ? The unmistakable cry to the farmer this year is, get more stock, more stock ; and there are signs which indicate there will be a demand for some time. Very well then, the stock will want feeding, and shall the farmer try to do this, or aim to grow the food or a good portion of it and sell the crop, as it were, in the flesh ? And while we are on the subject, do not let us forget that while crops are sold off as such the land stands to suffer, but when they go to market through stock there remains the manure to keep up the fertility of the land, add to its value, and increase its yielding capacity.—*Mark Lane Express.*

Pig Breeding.

In a lecture recently given by Professor Grisdale, one of the greatest living authorities on pig breeding and feeding, he is reported, says the *Live Stock Journal*, to have given the following expression to his views :—"As to the future, a world-wide survey of conditions, not only as regards hogs, but other lines of livestock as well, justifies the belief that profitable returns from hog-raising may be counted on for several months to come, at least. Even if prices do go down, there is money in hogs. Our own records at Ottawa for 15 years past show that in none of those years did we fail to make a profit, and in some years a very handsome profit, on hog-feeding."

Pollination of Prunes.

The question of what variety would best pollinise the Tragedy prune was brought up in a recent issue of the *Pacific Rural Press*, and it is stated, a little light on the matter can be gained from experience in Contra Costa county. On a ranch in the Alhambra Valley, near Martinez, there are a number of Tragedy prunes which had never borne well. Acting on the advice of another fruit grower, the owner grafted in some Clyman scions on a number of trees, and after these had blossomed a decided increase in yield was noted, the trees near the Clyman wood also bearing more uniformly. On the subject of pollination, the effect of Silver prunes on Robe de Sargeant has been seen on an orchard near Linden, San Joaquin county. The owner has about 450 Robe de Sargeants planted in alternate rows with Silver prunes, which have produced fine yields and large sizes. Neighbors with Robe de Sargeants alone have had smaller yields and smaller sizes, other things being approximately the same, and the men make replantings with French prunes or the Prune d'Agen. The fruitgrower in question considers the Robe de Sargeant the best of all. The Wickson also has the reputation of being an irregular bearer under some conditions. It is reported that in the Vaca Valley and elsewhere grafting in scions of the apple plum has made a great improvement in productivity.

Consumption of Tobacco in Germany.

The average yearly consumption of tobacco in Germany is estimated at 98,000 tons, valued at £6,500,000. Over two-thirds of the total quantity used is imported, the home production in recent years averaging about 30,000 tons, of the value of about £1,500,000. The net income from the taxation of tobacco amounted to £5,000,000 in 1911.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

"C. B.," Riverton, lost two cows; an examination showed the bible dry and hard. Cows were in fair condition and 24 hours before death showed no loss of appetite; they were on stubble, with brackish water. He asks if disease is catching.

Reply—The disease is not catching, but more cows may die, because they want variety in food. As a preventive give bonemeal licks (*see* back numbers of *Journal*), with ½oz. of saltpetre in lick per cow daily. To affected ones give a pint or more of yeast, or 2lbs. currants, and tincture bryonia 15 drops four times daily in a quart of milk or beer.

"A. J. H.," Coonawarra, has a four-year-old draught mare which is often troubled with swelling behind the jaws; the swellings are intermittent. She also has small lumps like peas on the body, especially the shoulders. The mare is in good condition and thriving well.

Reply—The symptoms are produced by the blood being out of order. It would be well to give her bran mashes only for two days and then a 6 dram aloes ball, which will purge her; a week later give her daily in food ½oz. of flowers of sulphur for 15 or 20 days.

A member of the McNamara Bore Branch, Agricultural Bureau, inquires the cause of a horse, while feeding, ejecting food from mouth; and at different times something has broken in the back of the mouth or nostrils and pus passes from nostrils. Another member has a horse which is more frequent in passing dung than the other horses, and before each dropping passes a small quantity of water. He cannot get the horse in good condition.

Reply—(1) Probably there is an abscess at the root of the upper molar tooth. Have teeth well examined; syringe nostril with potash permanganate

(Condy's crystals), as much as will lie on threepenny bit to quart of warm water, daily, and occasionally give pinch of snuff. (2) The trouble is intestinal indigestion. Feed on bran mashes only for a few days and then give 6 dram aloes ball, which will purge; after this is over, feed less chaff and plenty of bran, and give 10 drops tincture nux vomica in sugar or bran twice daily for a fortnight.

"J. O." asks the cause of a swelling on six-year-old mare's belly, from udder forward, which came and went at intervals.

Reply—Lymphangitis, very possibly connected with bloodworms. Give sulphur ½oz. and saltpetre ¼oz. once daily in food for 10 days.

"S. E. M." has a colt, three years, which has gone very poor and weak in back; it cannot rise without help and sits like a dog. He asks—Is it bloodworms? What is the remedy? The horses drink from a well in low swampy ground, the water being raised by a windmill to iron tank. He also asks whether kerosine will kill insects raised by the pump from the well.

Reply—The symptoms are those of an acute attack of bloodworms (*Sclerotomata*). Give once daily in a little chaff or bran Fowler's solution of arsenic, two tablespoonfuls every day for a fortnight, stop for a fortnight, and repeat for third (*see* back numbers of *Journal*). Also give in bran, if the colt will eat it, if not, mixed with a little molasses in the mouth twice daily 20grs., roughly a teaspoonful, of sulphate of quinine for the first fortnight, once daily for the second, and twice weekly for the third. Kerosine would put the horses off the water. Make a rough filter of bits of limestone and charcoal in a bag at the intake of the mill, do not fill the bag too full. Put sulphate of iron (copperas) in the tank, 1lb. per 1,000galls., or chlorinated lime (bleaching powder), 4ozs. per 1,000galls.

"H. S.," Charlton, inquires the cause of heavy draught horse continually lying down and pawing ground. The animal is losing condition and has little appetite.

Reply—The symptoms seem to point to trouble in the large bowels in which bloodworms are at work, and it is more than probable that the horse will die. Give a dessertspoonful of Fowler's solution of arsenic and a teaspoonful of sulphate of quinine twice daily, mix with a little molasses or sugar and put on the teeth if the horse is not eating, if he is, put it in the food. Rub the flanks vigorously for 10 minutes twice a day. Soft or green food, and encourage to drink as much as possible.

"A. H. S.," Eastern Well, asks cure for horse suffering from stoppage. Two hard balls can be felt in the bowels. The animal was dosed with fresh milk and also strong coffee, but with no effect.

Reply—As the hard balls of dung can be felt give copious enemas of soapsuds at body heat, and, if possible, put in one of them eight tablespoonfuls of glycerine. Rub the belly and flanks well for several minutes two or three times a day. Give 10 drops of tincture nux vomica in a little bran or molasses in the mouth four times a day. Bran mashes or greenfeed only till bowels are working loosely.

The Port Germein Agricultural Bureau asks for advice concerning a colt, rising four years, unbroken, which has been ill for eight days ; not eaten any food. Swelling on both sides of mouth, which broke three or four days ago, in a manner somewhat similar to strangles. The tongue is protruding about 1½in. from the mouth, is black and coated with a substance that peels off like a skin. Does not appear able to swallow. Wherever you put your hand on its body, the feeling is that of placing your hand on a sponge. The sheath also began swelling. There does not appear to be any stoppage in the bowels or water.

Reply—Most probably strangles, complicated by grass seeds at root of tongue ; these should be looked for and tongue treated with Condy. Give in drinking water twice daily for a few days 1oz. hyposulphite of soda, then for a few days tr. arsenicum, 10 drops twice daily. The spongy feel is due to the air getting under the skin, and will gradually disappear.

" W. B.," Pinnaroo, had a horse which had prolonged sub-acute stoppage of both water and dung, and eventually died. *Post mortem* showed lining of bowels completely rotten, liver black, and in gut ball of sand was found. He asks the cause of death and remedy for sand.

Reply—From the symptoms it is probable that the horse died of peritonitis, and probably there was a puncture of the bowel unnoticed. The sand had something to do with it. Sand remedy—1 pint milk, 1lb. honey, or 1 quart coffee, follow with tincture nux vomica 10 drops twice daily. Stoppage of water—gin ½ pint, essence peppermint 20 drops, water ½ pint.

" C. A. R." had a five-year-old horse which died after a fortnight's illness with intermittent colic. It was treated with coffee, sweet nitre, and rubbing for sand. The dung was alternately hard or scouring. He asks what should the treatment have been.

Reply—The symptoms in a five-year-old rather point to an internal abscess either in the bowels or liver, and probably no treatment would have been of any avail; but in a sandy country it is always well to treat for sand occasionally, either with coffee or milk and honey, and give a teaspoonfull of powdered nux vomica in the feed two or three times a week.

" F. A. M." has been trying for some months to cure a young mare of swelling on fetlock which exudes fluid. He has used a preparation five times, but with little effect. He asks—(1) Would it be advisable to continue treatment ; (2) should mare be stabled or paddocked ; (3) what best treatment.

Reply—After five applications of the remedy it is not much good going on with it ; the animal would be better in the paddock. Put a good pitch plaster on half an inch thick, or better, write to chemist for a "charge bandage" and apply tightly round fetlock and leave on for some months; this will reduce the swelling somewhat, but it will always recur with work.

"J. E. F. M.," Karoonda, seeks a remedy for sore shoulders on horses which have to be worked.

Reply—Try white lead 2ozs., neatsfoot oil 1 pint, tincutre arnica ½oz. Apply to sore and collar in the morning and noon, and on the sore at night. Horses can generally be kept working with this; beat out collars well and use branbag numdahs.

"A. J.," Rudall, has a mare which was cut with barbed wire two years ago; 18 months later the strained the same leg; the lump hardened and the mare is now very lame.

Reply—The hock joint is evidently involved in the series of accidents, and treatment is not likely to be of much good. If in foal it would be well to put on a good pitch plaster and turn the mare out. Work is out of the question.

A member of the Morphett Vale Agricultural Bureau inquires cause of horse eating dirt whenever it gets opportunity.

Reply—This is a symptom of indigestion, and is often relieved by the following powder once daily in the food:—Bicarbonate of soda, gentian root, of each 1 dram; flowers of sulphur, common salt, of each ½oz. The indigestion most often arises from irritation of small worms in the stomach.

"J. E. F.," Karoonda, has a horse which developed sudden lameness. At first there was a slight swelling above fetlock, which subsequently spread over and up leg.

Reply.—As the animal was in the fire rake it is possible it has been staked. If not that, a snake bit it, or it may be a strain of a tendon. The following lotion applied once or twice daily will be of use:—Tinct. arnica, 1oz; methylated spirit, ½ pint; glycerine, ½ pint.

"A. L. V.," Brentwood, asks treatment for mare attacked with colic pains. She passes dung lying down, and is worse after drinking.

Reply.—Probably due to sand, for which the coffee already given should prove effective. Give tinct. nux vomica, 10 drops, three times daily in the mouth for a few days, then twice daily for a week; after which a tablespoonful of sulphur and a teaspoonful of baking soda mixed once a day in food for a week.

"J. A. H.," seeks advice concerning pigs which have a disease causing them to lose power in front legs.

Reply.—Due probably to worms. Give daily in food a teaspoonful of flowers of sulphur and a similar amount of Epsom salts; continue for several days until recovery is well established. The mixture is preventive as well as curative. As a regular thing give cinders or charcoal in the food.

ROSEWORTHY AGRICULTURAL COLLEGE.

Harvest Report, 1913-14.

By ARTHUR J. PERKINS, Principal Roseworthy Agricultural College.

(Continued from page 811.)

WHEAT CROPS.

FIELD "EBSARY'S" B.

The past history of this field may be summarised as follows :—1899, purchased and fallowed ; 1900, wheat ; 1901, bare fallow ; 1902, wheat ; 1903, bare fallow ; 1904, oats ; 1905, pasture ; 1906, bare fallow ; 1907, oats ; 1908-9, pasture ; 1910, bare fallow ; 1911, wheat and barley ; 1912, bare fallow ; 1913, wheat.

This field never made very good growth, and was very badly affected with red rust ; portion of it was cut for hay ; the balance was allowed to ripen and cut subsequently for grain, with results that are indicated below in Table XI.

TABLE XI.—*Showing* 1913 *Wheat Yields in Field "Ebsary's" B.*

Variety.	Selection.	Date Sown.	Area Sown. Acres.	Yield per Acre. Bush.	lbs.
Queen Fan	2nd	May 17–20	10·500	8	5
Queen Fan	3rd	May 20–21	3·095	8	0
Gluyas	6th	May 22	0·749	6	19
College Eclipse	5th	May 21–22	5·491	5	48
Late Gluyas	7th	May 20–21	1·748	4	45
King's Red	7th	May 22	4·169	4	23
King's White	7th	May 21–22	3·421	4	14
Beardless King	2nd	May 21	1·919	2	38
College Comeback	5th	May 21	1·735	1	55

Thus, then, about 33 acres of wheat of various varieties, sown on carefully fallowed land, barely averaged 6bush. to the acre. These are results that I did not think the district capable of.

FIELD "DALY'S."

This field was purchased for the College in 1912, and fallowed by us in the same year. The 1913 crops represented, therefore, the first crops raised by us in this field. Growth was very irregular in this field, and red rust quite as bad as in the preceding one. Portion of the field was cut out for hay, the balance being harvested for grain with results that are shown in Table XII.

TABLE XII.—*Showing* 1913 *Wheat Yields in Field "Daly's."*

Variety.	Selection.	Date Sown.	Area Sown. Acres.	Yield per Acre. Bush.	lbs.
Marshall's No. 3B	4th	May 16	3·313	9	2
Late Gluyas	6th	May 17–19	6·738	9	1
College Eclipse	4th	May 16–17	13·090	7	16
Marshall's No. 3A	4th	May 14–15	5·988	5	57
Jonathan	3rd	May 15	4·604	5	41
Marshall's No. 3B	5th	May 10	2·866	5	35
Jonathan	4th	May 9	0·876	5	23
Yandilla King	1st	May 13	1·131	4	53
Federation	4th	May 13	0·665	3	54
Federation	3rd	May 16–17	5·026	3	48
King Fan	4th	April 29–30	2·839	3	18

In this field, then, about 47¼ acres were cut out for grain and yielded a little over 6¼bush. to the acre.

FIELD NO. 5 B.

The past history of this field may be summarised as follows :—1897, bare fallow ; 1898, wheat ; 1899, wheat ; 1900, bare fallow ; 1901, wheat and oats ; 1902, pasture ; 1903, bare fallow ; 1904, wheat ; 1905, pasture ; 1906, bare fallow ; 1907, wheat ; 1908, bare fallow ; 1909, wheat ; 1910-11, pasture ; 1912, bare fallow ; and 1913, wheat.

This field is 76 acres in area and was sown to various varieties of wheat, the whole of which, with the exception of the headlands, was cut out for grain. Details concerning the various plots are shown below in Table XIII.

TABLE XIII.—*Showing* 1913 *Wheat Yields in Field No.* 5 *B.*

Variety.	Selection.	Date Sown.	Area Sown. Acres.	Yield per Acre Bush.	lbs.
Gluyas	7th	May 27	3·603	9	55
Gluyas	4th	May 27–29	29·884	8	7
Gluyas	6th	May 27	1·072	8	0
Petatz Surprise	2nd	May 27	3·842	6	21
Queen Fan	1st	May 23–26	27·427	5	49
Late Gluyas	6th	May 26	2·248	5	14
Late Gluyas	5th	May 26	9·381	5	13

In this field about 77½ acres yielded slightly under 7bush. to the acre. All the varieties were dressed with superphosphate at the rate of 2cwts. to the acre.

FIELD "FLETT'S."

The past history of this field may be summarised as follows :—1902, purchased and fallowed ; 1903, wheat ; 1904, bare fallow ; 1905, wheat ; 1906, pasture ; 1907, bare fallow ; 1908, wheat ; 1909, pasture ; 1910, bare fallow ; 1911, wheat, barley, and oats ; 1912, bare fallow ; and 1913, wheat, barley, oats, and rye.

This field is 176 acres in area, and portion of it was cut for hay, as has already been indicated. About 14 acres were taken up with hand selection seed plots, the balance of the field being under various varieties of wheats, many of which are new ones of our breeding.

Full details concerning these various wheats are shown below in Table XIV.

TABLE XIV.—*Showing Yields of some new College Crossbred Wheats* (1907, 1908, *and* 1909 *Crosses*).

Varieties.	Selection.	Nature of Cross.	Area.	Yields per Acre.			
				1913.		1912.	
			Acres.	Bush.	lbs.	Bush.	lbs.
Editor	1st	Bearded Rieti x Fan x Petatz Surprise (1909)	0·100	14	40	—	
Brindle....	1st	Carmichael's Eclipse x Red Fife (1907)	0·225	12	31	13	4
Canaan....	1st	Jonathan x Fan (1908)	0 575	10	23	23	20
Basil.......	1st	Fan x Red Fife (1907)...............	1·851	10	19	23	0
Fancy.....	2nd	Fan x Comeback (1908)	0·800	8	8	--	—
Fancy.....	1st	Fan x Comeback (1908)	0·325	8	3	10	43
Daphne ...	1st	Late Gluyas x Fan (1908)...........	0·825	7	19	20	14
Iguano ...	1st	Gluyas x Fan (1907)	4·677	7	16	21	41
Caliph	1st	Marshall's No. 3 x King's White (1908)	1·526	6	53	28	20
Bijou	1st	Marshall's No. 3 x Fan (1907)	2·176	6	48	23	35
Anvil	1st	King's White x Jonathan (1907)	1·726	5	22	26	16
Ensign ...	1st	Marshall's No. 3 x Petatz Surprise (1909)	0·150	5	13	—	
Elite	1st	Late Gluyas x Petatz Surprise (1909)..	0·075	5	7	—	
Earl	1st	Marshall's No. 3 x Indian Runner x Marshall's No. 3 (1909)	0·175	4	34	—	

TABLE XV.—*Showing* 1913 *Yields of Latest Strains of College Hand-selected Pedigree Wheats Comparatively with the Yields of Earlier Strains in Previous Seasons.*

Varieties.	Selection.	Area.	Yields per Acre.											
			1913.		1912.		1911.		1910.		1909.		Means.	
		Acres.	B.	lbs.	B.	lbs.	B.	lbs.	B.	lbs.	B.	lbs.	B.	lbs
Gluyas	8th	1·225	10	56	21	32	8	34	21	29	28	23	18	11
College Eclipse........	6th	1·326	10	39	21	54	12	27	25	8	24	47	18	59
Queen Fan	4th	1·401	9	55	23	6	22	25	—		—		—	
Marshall's No. 3B	6th	1·526	9	39	21	36	7	37	26	38	27	22	18	34
King's Red	8th	1·951	8	39	27	34	12	37	22	43	33	41	21	3
Bearded Gluyas	8th	0·325	8	31	28	6	14	38	20	51	30	35	20	32
King's White	8th	1·626	8	30	26	53	17	0	23	27	29	10	21	2
Wilmington	3rd	0·800	8	19	22	21	15	0	—		—		—	
Carmichael's Eclipse ..	6th	1·276	7	55	22	53	16	53	28	21	22	50	19	46
College Comeback	6th	1·250	7	19	17	27	8	4	29	12	19	16	16	16
Late Gluyas	8th	1·075	7	16	23	44	14	4	22	50	33	8	20	12
Petatz Surprise	3rd	1·125	7	3	24	9	11	20	10	44	8	16	12	18
Fan.................	5th	0·950	6	43	15	36	8	45	25	3	13	9	13	51
Marshall's No. 3A	6th	1·576	6	32	13	54	13	54	25	52	20	15	16	5
Federation...........	5th	1·175	6	22	22	13	11	52	25	48	33	20	19	55
Huguenot	3rd	0·454	6	21	10	38	—		—		—		—	
Jonathan	5th	1·050	6	16	24	55	10	26	24	1	27	24	18	36
Beardless King	4th	0·900	6	14	9	35	—		—		—		—	
Yandilla King	2nd	1·526	6	4	17	27	—		—		—		—	
Lamda	8th	0·350	5	51	28	39	—		13	6	5	57	—	
King Fan	4th	1·054	5	15	21	34	8	33	27	11	—		—	
Cape Wheat	4th	0·125	3	20	17	36	5	8	21	14	—		—	
Beardless Odessa	3rd	0·437	2	17	20	22	—		—		—		—	

TABLE XVI.—*Showing Yields of other Miscellaneous Wheats Grown in "Flett's."*

Varieties.	Remarks	Area. Acres.	Yields per Acre. Bush.	Yields per Acre. lbs.
Mahmoudi	Algerian maccaroni wheat	0·926	12	45
Dymenos	Greek maccaroni wheat	0·926	11	55
King's Red (Sel. 7)	—	1·241	8	7
Sevens	—	0·050	7	20
Marshall's Dorath	—	0·950	6	38
King's Red (Sel. 6)	—	23·140	6	37
Crossbred 53	A West Australian wheat	1·175	6	36
Tunis	A soft-grain African wheat	0·050	6	0
Algiers	A soft-grain African wheat	0·025	6	0
Marshall's Prolific	—	0·950	5	44
Egypt	Soft-grain Egyptian wheat	0·917	5	35
American No. 8	—	0·225	5	16
Cumberland	—	0·700	5	33
Nhill	—	0·225	5	2
Huguenot (Sel. 2)	—	0·249	4	33
Lamda (Sel. 7)	—	0·625	4	13
Correll's No. 7	—	0·225	3	2
Beardless Odessa (Sel. 2)	—	0·610	3	2
Smith's Crossbred A	—	0·018	2	47
Smith's Crossbred B	—	0·027	0	37

All the wheats in Tables XIV., XV., and XVI. were sown during the month of May, but did not show above ground before the 28th of July. All plots were dressed with 2cwts. of superphosphate to the acre. The total area under wheat in "Flett's" was close on 73 acres, and yielded 7bush. 14lbs. to the acre.

GRAINGER CULTIVATION PLOTS.

These plots were established in 1911 with the object of testing the influence on wheat crops of various methods of treatment of bare fallow. There are 12 plots in all, each one a little over four acres in area; and alternately in each successive year one half of the plots are treated as bare fallow, whilst the other half comes under wheat.

Of these plots four pairs illustrate what may be termed early fallow, *i.e.*, they are ploughed up in early July; whilst the remaining two pairs illustrate late fallow, *i.e.*, land ploughed up after the 1st of September. In the early fallow plots the value of the following practices is under observation:—(1) Heavy rolling immediately after ploughing (Plot 1); (2) harrowing immediately after ploughing (Plot 2); (3) leaving the ploughed land in the rough state until spring (Plot 3); and (4) giving the land a second shallow ploughing with the skim-plough. In the late fallow plots the following two practices are being tested:—(1) Comparatively deep ploughing followed immediately by heavy rolling (Plot 5); and comparatively shallow ploughing on land that is only cultivated and harrowed according to requirements (Plot 6).

In 1913, as was indeed the case in 1912, these plots were sown to College Comeback wheat at the rate of 100lbs. to the acre with 2cwts. of superphosphate. Seeding took place between May 9th and 15th, but the crop did not show above ground until the last days of July.

The treatment, in the several plots, of the bare fallow that carried the 1913 crops, was as follows :—

EARLY FALLOW PLOTS.

Plot 1.—1912—July 4-6, ploughed 7in. deep ; July 16, rolled ; August 23, cultivated ; October 3, cultivated ; October 7, harrowed ; November 7, harrowed 1913—January 29-31, cultivated ; February 27-28, cultivated ; April 2, harrowed ; and May 8, cultivated before the drill.

Plot 2.—1912—July 8-10, ploughed 7in. deep ; July 17, harrowed ; August 23, cultivated ; October 3, cultivated ; October 7, harrowed ; November 7, harrowed. 1913—January 29-31, cultivated ; February 27-28, cultivated ; April 2, harrowed ; and May 9, cultivated before the drill.

Plot 3.—1912—July 10-12, ploughed 7in. deep ; October 1, cultivated ; November 6, cultivated. 1913—January 29-31, cultivated ; May 9, cultivated before the drill.

Plot 4.—1912—July 12-16, ploughed 7in. deep ; August 24, cross skim-ploughed ; October 3, cultivated ; October 7, harrowed ; November 8, harrowed. 1913—January 29-31, cultivated ; February 27-28, cultivated ; April 2, harrowed ; and May 10, cultivated before the drill.

LATE FALLOW PLOTS.

Plot 5.—1912—September 19-24, ploughed 7in. deep, and whatever area was ploughed was always rolled on the same day ; October 2, cultivated, rolled and harrowed ; November 8, harrowed. 1913—January 29-31, cultivated ; February 27-28, cultivated ; April 2, harrowed ; and May 13, cultivated before the drill.

Plot 6.—1912—September 25-27, ploughed 4in. deep ; October 7, cultivated ; November 8, harrowed. 1913—January 29-31, cultivated ; February 27-28, cultivated ; April 2, harrowed ; and May 13. cultivated before the drill.

I append below in Table XVII. the 1913 yields of these plots comparatively with the yields of the preceding year.

TABLE XVII.—*Showing 1913 Yields of Grainger Cultivation Plots Comparatively with Yields of the Preceding Year.*

Plots.	Grain per Acre.			Total Produce per Acre.		
	1913. B. lbs.	1912. B. lbs.	Means. B. lbs.	1913. T. c. l.	1912. T. c. l.	Means. T. c l.
Early fallow—						
1	8 25	20 44	14 35	0 16 90	1 15 104	1 6 41
2	6 45	22 45	14 45	0 14 109	1 17 43	1 6 20
3	6 27	20 31	13 29	0 13 91	1 13 100	1 3 96
4	6 36	22 16	14 26	0 14 14	1 17 40	1 5 83
Means of early fallow	7 2	21 34	14 18	0 14 104	1 16 16	1 5 60
Late fallow—						
5	5 4	22 45	13 55	0 12 7	1 19 19	1 5 69
6	3 23	16 27	9 55	0 9 60	1 6 88	0 18 18
Means of late fallow	4 14	19 36	11 55	0 10 90	1 12 110	1 1 100

These experiments on the handling of bare fallow I propose continuing in future years; in the meanwhile, however, we may note the following conclusions that may be drawn from the results of two seasons:—

1. Both in a relatively favorable season—1912—and in a very unfavorable one—1913—the yields of the early fallow plots were superior to those of the late fallow plots, both in grain and in total produce, or hay. This superiority of the early fallow plots was, however, far more pronounced in 1913 than in 1912, being represented by close on 40 per cent. for grain and 28 per cent. for total produce; whilst in 1912 it was only a little above 9 per cent. for grain and not quite 9 per cent. for total produce. And if we take the mean of the two seasons' returns we find that early fallow proved itself superior to late fallow by close on 17 per cent. in the matter of grain, and over 14 per cent. in the matter of total produce or hay.

2. In the matter of the handling of early fallow, the more thorough tillage given to Plots 1, 2, and 3, which carried with it a certain amount of winter after-working, appears to have resulted in yields somewhat superior to those obtained on the less frequently tilled Plot 3.

3. It may be remarked that the rolling given to Plot 1 appears to have favored both the growth and yield of Plot 1 in a bad season like 1913.

4. In both 1912 and 1913 the practice of leaving fallow land untilled until the spring months appears to have resulted unfavorably relatively to land worked over in the winter months of the year.

5. In the matter of late fallow, deep ploughing, followed immediately by heavy rolling, has yielded far better results than shallow ploughing without rolling. Indeed, in 1912, the yields on this late fallowed plot were quite equal to the best of the early fallow plots.

THE GRAINGER DEPTH OF PLOUGHING TESTS.

These tests consist of a series of 12 plots, one half of which are treated in alternate years as bare fallow, whilst the other half comes under wheat. Each plot is one acre in area. When these plots are fallowed, Plots 1 and 2 are always ploughed to a depth of 2in.; Plots 3 and 4 to a depth of 4in.; and so on with intervals of 2in. until we reach Plots 11 and 12, which are ploughed to a depth of 12in. The object in view, therefore, is to ascertain the influence of depth of ploughing on the growth of wheat crops.

The 1913 crops, which were the third crops in these tests of which we have any record, were sown on May 16th with King's White at the rate of 90lbs. of seed to the acre and 2cwts. of superphosphate.

The 1913 yields, together with the mean yields for the three years (1911-1913), are shown below in Table XVIII.

Table XVIII.—*Showing* 1913 *Yields of Depth of Ploughing Plots, together with the Means for* 1911-1913.

Plots.	Depth of Ploughing.	Grain per Acre.				Total Produce per Ac.					
		1913.		Means for 1911-13.		1913.			Means for 1911-13.		
		B.	lbs.	B.	lbs.	T.	c.	l.	T.	c.	l.
1 and 2	2in.	11	55	16	53	0	19	32	1	10	63
3 and 4	4in.	7	31	18	43	0	13	94	1	11	41
5 and 6	6in.	7	48	18	19	0	14	23	1	10	83
7 and 8	8in.	8	34	19	26	0	15	20	1	11	48
9 and 10	10in.	9	11	19	25	0	16	43	1	11	88
11 and 12	12in.	8	32	19	20	0	12	86	1	11	0

We have as yet, in connection with these depth of ploughing experiments, the results of only three seasons; and we are not in a position, therefore, to set out any very definite conclusions on the subject. We may, however, note in the meanwhile the following points:—

1. In 1913, the highest yield, both of grain and total produce, was secured from the plot that had been fallowed to a depth of only 2in. This result is certainly remarkable, and must be set down to the infinitely better germination which took place in this plot when compared with those that had received deeper ploughing. For the rest, the yields were heavier in those plots ploughed between 8in. and 12in. than in those ploughed 4in. to 6in. deep.

2. If we average the two seasons, the heaviest yields are shown to the credit of plots ploughed 8in., 10in., and 12in. deep, all of them averaging approximately 19¼bush. to the acre. Plots ploughed 4in. and 6in. deep averaged about 1bush. less, and the plot ploughed 2in. deep about 2bush. less than the latter.

THE GRAINGER SUPERPHOSPHATE PLOTS.

These plots were set going in 1909, the year in which we acquired the farm known as "Grainger's." The object in view was to test the relative value of light and heavy dressings of phosphatic manures both on the yield of wheat crops and on the carrying capacity of the land when left out of crop. And for this purpose the Grainger farm was admirably suited, since it had been dressed with superphosphate in the past only very slightly, if at all. These plots consist of 15 plots, 2·82 acres in area each, and arranged in five series of three plots each. In each season one of these plots is treated as bare fallow, another comes under wheat, and a third is grazed over with sheep. The first series of three plots is to remain permanently unmanured, whilst the second series receives ¼cwt. of superphosphate every time it is under wheat; the third 1cwt. of superphosphate; the fourth 2cwts. of superphosphate; and the fifth 3cwts. of superphosphate.

I have summarised below in Table XIX. the 1913 yields of these plots, together with the means of the results since 1910.

Table XIX.—*Showing* 1913 *Yields of Grainger Superphosphate Plots, together with the Mean Yields since their Inception,* 1910-1913.

Plots.	Treatment.	Grain per Acre.				Total Produce per Ac.					
		1913.		Means. 1910-13.		1913.			Means 1910-13.		
		B.	lbs.	B.	lbs.	T.	C.	L.	T.	C.	L.
1–3	No manure	2	26	9	43	0	5	78	1	0	10
4–6	½cwt. superphosphate	4	49	15	42	0	8	97	1	6	38
7–9	1cwt. superphosphate	5	47	17	10	0	11	98	1	11	83
10–12	2cwts. superphosphate	6	14	16	51	0	12	82	1	12	80
13–15	3cwts. superphosphate	5	26	17	18	0	14	45	1	15	7

We may note from the above table that whilst each additional quantity of manure used would appear to lead to improvement in yields, at the same time the law of diminishing returns comes fairly early into action. Thus, taking the mean results of four seasons, ½cwt. of superphosphate added 6bush. to the yield of the no-manure plots, whilst an additional ½cwt. of superphosphate only added 1½bush. to the ½cwt. plots ; and with still heavier dressings the improvement in grain yield, if any, is barely perceptible. It is, on the other hand, a little more marked in the case of total produce or hay. In favor of heavy dressings of superphosphate I have also repeatedly pointed out elsewhere that we have always noted a very marked improvement in the sheep-carrying capacity of the land whenever it happened to be left out of cultivation.

THE PERMANENT EXPERIMENT FIELD.

Full details concerning the manure and rotation plots in this field are published from time to time in separate reports. In the general harvest report I shall content myself with stating that in this field there were 58·029 acres under wheat, variously treated and manured, which, in 1913, yielded 5bush. 55lbs.

1913 GENERAL FARM AVERAGE OF WHEAT.

We are now in a position to determine what has been the general farm wheat average for the 1913-14 season. We had under wheat 333·07 acres which returned us 2,175bush. 5lbs., or an average yield of 6bush. 32lbs. to the acre ; unquestionably the lowest average ever reaped on the College Farm, at all events within my recollection. In my view, this extremely low average can be accounted for only by the very unfavorable distribution of the rainfall indicated in the earlier part of this report, together with unseasonably early hot north winds and a virulent attack of red rust. How this average compares with those of recent years is shown below in Table XX.

TABLE XX.—*Showing the Average Yield of Wheat on the College Farm, 1904-1913.*

Season.	Rainfall. "Useful." Inches.	Rainfall. Total. Inches.	Area under Wheat. Acres.	Average Yield per Acre. Bush.	Average Yield per Acre. lbs.
1904	11·60	14·70	330·00	18	3
1905	14·23	16·71	212·00	24	11
1906	16·30	19·72	318·00	14	30
1907	13·81	15·05	178·00	13	20
1908	15·53	17·74	258·52	22	14
1909	21·15	23·05	328·47	25	5
1910	16·79	23·87	267·35	16	38
1911	9·46	13·69	234·98	14	17
1912	13·05	14·97	232·89	19	36
1913	10.82	15·66	333·07	6	32
Average yield of 10 years				17	27

Wheat Stacks Port Wakefield.

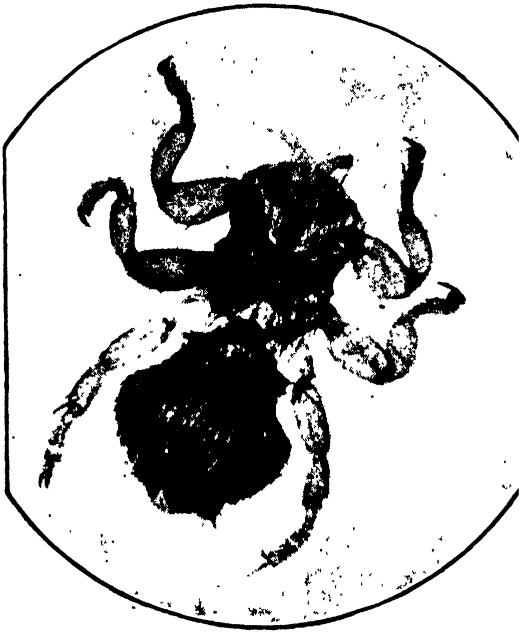
THE SHEEP TICK.

LIFE HISTORY.

(By F. E. Place, B.V.Sc., M.R.C.V.S., Government Veterinary Lecturer.)

The sheep tick, according to Dr. J. Fiebiger, belongs to the class *Hexapoda*, order *Diptera*, sub-order *Pupipara*, species *Malophagus ovinus*, sometimes called the sheep louse fly.

Length 3-5mm., hairy, reddish-yellow body with irregular striping on the back, antennæ naked, eyes small, wingless, double claws on feet; the female is the larger, and produces 4-5 larvæ in a year; these are 5·7mm. long, whitish, smooth and flattish, with small roundish projections in front, bearing at the apex two small suckers. Pupation and development appear to take place in the ground.



Sheep Tick (*Malophagus Ovinus*—Lat.). × 14.

Habitat.—On sheep among the wool, they suck blood, and their excrement stains the wool greenish, their bite is only slightly painful, and causes a dark spot with lighter surrounding ring. Their presence and mode of life tend to

[Microphotographs by Mr. D. F. Laurie, Poultry Expert.]

destroy the staple of the wool, and when they are present in large numbers the sheep lose flesh.

Neumann describes it as " One of the only two species of *Pupipara* of interest, which, being wingless, is a permanent parasite, generally responsible for lousiness in the sheep." This, in my opinion, is a loose statement, and not accurate as far as South Australia is concerned. It is nourished on the yolk of the wool and the blood caused by its bites ; thus living like a louse, although really a fly.

Macquart describes it—Head disengaged from thorax, palps elongated, antennæ nude and tuberculated, eyes small and very close, no occelli, thorax somewhat narrow, abdomen oval, feet downy, tarsal claws bidentated, wings null, generally rusty colored and irregularly spotted, length of body 3-5mm. These particulars are excellently brought into prominence in the photos herewith.

Neumann further states—" The presence of the *Malophagus* is indicated by the pupæ which are attached to the individual fibres of the wool, and appear as shining oval bodies, not unlike small apple pips in color and shape. On separating the wool, the parasites are found close to the skin, and when they are numerous the fleece is entangled (pointy), and sometimes absent in places." The *Malophagus* emigrates from ewes to lambs, which it sometimes torments so much as to cause serious emaciation. If the fleece is short, in order to avoid the teeth of the animal, the parasite takes refuge in front of the shoulders, on the neck, and particularly about the ears and horns. By biting they produce great itching, which makes the sheep gnaw themselves, scratch, and rub. The *Malophagus* species are at times so abundant as to constitute a veritable scourge, and yet they are not prolific, for the female lays only one larva at a time, and only four or five in the course of a year.

EFFECT ON SHEEP.

(By Henshaw Jackson, Wool Instructor, School of Mines and Industries.)

The loss to a sheepbreeder by reason of his animals being tick-infested is more real than apparent, for the reason that tick-stained wool sells just as readily on a price per pound basis as that which is not so affected, and in consequence the owner cannot see how ticks can discount his wool cheque. To all intents and purposes a ticky sheep is a sick sheep and cannot produce a robust staple, but invariably brings to the shearing-board a fine, thin-haired fleece, very suitable for the production of certain superfine materials, and consequently, from a quality standpoint, of considerable value per pound. Price per pound, however, is not the criterion of value so much as return per head, and 5lbs. of ticky wool per sheep is not to be compared with 8lbs.

to 10lbs. of robust, bright, clean fibre, so far as the actual money return is in question. Again, apart from the wool, there is the carcass to be considered, and a ticky sheep is never fat; so that where meat is concerned we are up against another loss. The tick is a blood sucker, and saps the vitality of sheep, to a very large extent rendering its existence miserable and preventing it from fulfilling its functions as a source of profit on the farm.

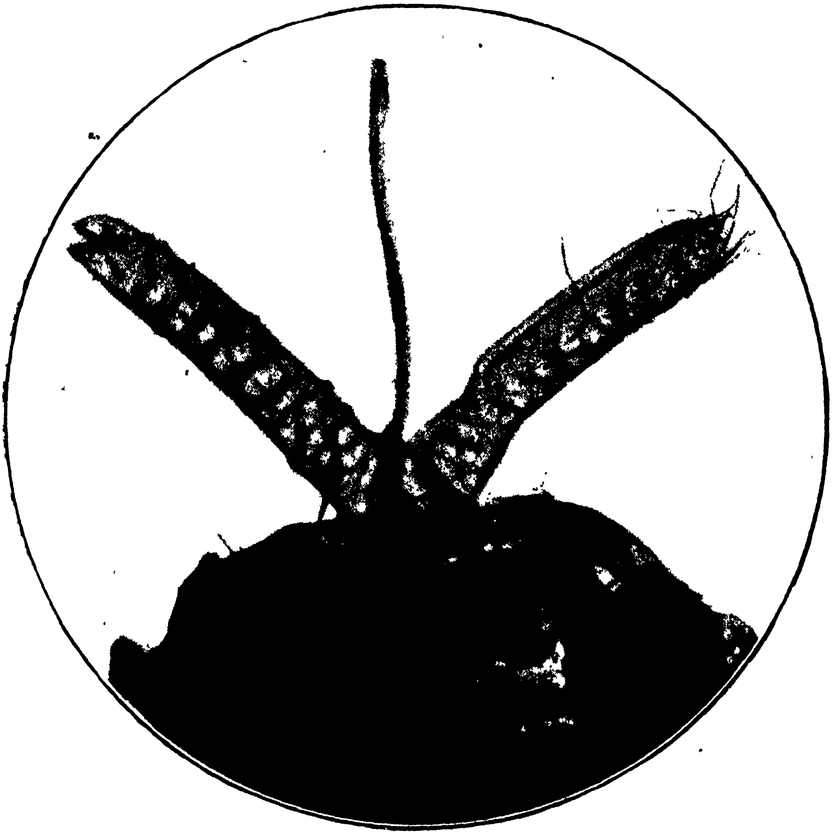
SHEEP TICK (*Malophagus Ovinus*—Lat.).
Dissected Head. Shews Palpi and Proboscis (Stained Eosin). × 80.

From an economical sense, then, apart from any humanitarian aspect, the eradication of sheep tick is a necessity. Prevention is easy enough. By using a reputable poisonous dipping preparation and putting the sheep through a bath of the same about four weeks after shearing in the case of Merinos, and six to eight weeks after shearing with Longwools or Crossbreds, it will be found that the sheep will remain immune to and free from ticks throughout the year, and produce both a heavier fleece and better carcass, and in the case of ewes a better and thriftier lamb.

THE TICK IN SOUTH AUSTRALIA.

(By T. H. Williams, Chief Inspector of Stock.)

This parasite was, no doubt, introduced on sheep imported from Great Britain. They were numerous on sheep in the South-East and on Yorke's Peninsula over 50 years ago. Little appears to have been done to check their spread till 1890, when regulations were issued under the Stock Diseases Act compelling owners to dip tick-infested sheep.



Sheep Tick (*Malophagus Ovinus*—Lat.).
Head, Palpi, and Proboscis. × 95.

Their Present Distribution.

The South-East and South, the ranges east of Adelaide, Yorke's Peninsula, the Lower and Middle North, the West Coast, and Kangaroo Island.

The Annual Loss Caused by Ticks.

It is quite within the mark to say that £100,000 worth of wool and condition is annually lost to owners who neglect to keep their sheep and lambs free of this pest. Over 300 clips, large and small, recently examined, were found weak and badly stained. It was estimated by experts that the loss on one small clip alone, which netted the owner about £100, was £20—due to the presence of ticks. All breeders of lambs are aware of their unthrifty, stunted state when infested with parasites ; few, however, appear to realise what the annual loss really means. Thousands are reduced in value from 2s. 6d. to 5s. per head.

THE REMEDY.

Dip the sheep and lambs in some of the best known poisonous dips on the market. Examine frequently, and should parasites be discovered, dip again. It only costs about 1d. per head to increase the value of the animal from 2s. 6d. to 5s. Do not overlook the fact that the parasites quickly spread from infected ewes to their lambs.

SHEEP TICK (*Malophaqus Ovinus*—Lat.).
Tarsi, Hooklets, &c. × 94.

Some Fallacies.

There are many sheepowners to-day who will glibly assert that "poverty breeds parasites on sheep." This absurd fallacy has long been exploded. Many thousands of our Far Northern sheep, which become poor (poverty-stricken), are not infested with parasites, while on the other hand, sheep in from good to fair condition in tick-infested districts rapidly fall off if the parasites are allowed to increase on them. It would be quite as logical to assert that poverty-stricken pastures bred sheep, as to argue that poverty breeds ticks on the sheep. Do not lose sight of the fact that male and female parasites are both present to complete their life cycle on the sheep and that they live on their host's blood, and thus become one of the chief factors in reducing them to a poverty-stricken state.

The Legal Side.

Tick was declared to be an infections and contagious disease under the provisions of the Stock Diseases Act in 1890, and under clause 19 of the Act owners are compelled to report to the Chief Inspector of Stock, Adelaide, and the Inspector of Stock for the district, when their sheep are infected with parasites. The penalty for neglecting to comply with this provision is £20 per day.

The regulations provide that sheep infected at time for shearing must be dipped within one month. If one sheep in a flock is infected, the whole flock is deemed to be infected. No person, drover, or owner shall permit infected sheep to stray on public roads, lands, commons, or reserves, nor travel infected sheep from place to place, or on roads, commons, or reserves. No person shall move any infected sheep from the land on which they are kept or depastured without permission from an Inspector of Stock. No owner or other person shall expose infected sheep in any market or saleyard, whether public or private.

The penalties for breaches of the above regulations are from £5 to £100.

Camel Team, Oodnadatta.

RELATION OF IN-BREEDING AND CROSSING IN PRODUCING A TYPE OF SHEEP.

(By Henshaw Jackson, Wool Instructor,. School of Mines and Industries.)

The present is particularly the day of small breeders, and the establishment of small flocks is becoming a marked feature in connection with the advance of mixed farming. Such being the case, it may be useful to discuss some of the questions which arise in connection with the foundation and continuance of a type of sheep that will be at once profitable and creditable to the owner. When commencing to breed with pure-blooded stock it is a cardinal point with such animals that " like will beget like," and with a sire and dam perfect in any one direction we may safely expect the offspring to be the " living image " of its parents in this respect. If, on the other hand, either ram or ewe be defective, the progeny, subject to a natural law, will be half-way between the two. With both parents defective in the same direction their progeny will be so more than either, having in effect inherited the sum of their weakness, which is added together in the body of the latest born. The number of perfect animals being comparatively small, the art of breeding lies in a system of counterbalancing, or breeding out of the offspring, the defects of one parent by the distinguishing superiority of the other in the same points. To the parent possessing the highest strain of purity belongs the greatest power of stamping its individual characteristics on its progeny; but if blood be equal the ram possesses greater power in this respect than the ewe.

The Ram.

When commencing to breed it is open for us to begin on ewes that may have any defects short of cardinal ones, always providing that we use the proper ram, and gradually throw out as we progress all ewes showing considerable fault, every year becoming more vigorous in culling. There must be no mistake in our choice of a ram at the beginning ; then is the time to exercise the utmost care in his selection, never losing sight of the fact that whatever weaknesses he may exhibit will be stamped upon the whole of the future flock. Should the defects be material ones, such as hollow back, thin or hairy or uneven fleece, the future descendants will be of poor quality and small value. If the ram closely approaches perfection, or as near as may be, the defectiveness of the ewes will be decreased and gradually bred out. It is, however, practically impossible to obtain perfect rams, so we must choose those having the least material faults, and which can be met and counterbalanced as breeding progresses by the decided excellence of the ewes in the same points. Should one ram be rather long in the leg, then give him short-legged ewes; if his fleece is too yolky, mate him with the driest-woolled ewes, and so on.

Where it is possible to draw upon choice rams as required, this system of counterbalancing calls for little skill did each parent possess but one fault. If the ewe is a trifle light in the wool but good in every other respect, not much judgment would be needed to decide that she be bred to an extra heavy-fleeced ram. Generally speaking, however, most animals have several defects in greater or less degree, and to mate in such a way that every fault in the dam shall be met with its opposite in the sire, and *vice versa*, requires not only ample material for selection, but the keenest discrimination and experience.

IN-BREEDING.

Let us suppose that we have already established our flock successfully on good lines of breeding which provide excellent character. To continue means that we must go on breeding in and in, or seek fresh blood from other flocks at the risk of losing the distinctive characteristics we have now obtained. The question at once arises as to which is the policy to pursue, so I shall now endeavor to place the matter in shape to form a conclusion.

Opponents of in-and-in breeding contend that diseases and all other defects are thereby rendered hereditary, and that there is a tendency to decrease in size, with debilitation and general break up of the constitution. Apologists for the system, on the other hand, say that if the parent stock is healthy, inter-breeding does not of itself diminish healthiness or weaken the constitution of the offspring. They also aver, with a great degree of truth, that by no other means can the skilful breeder arrive so rapidly at the desired standard, and unless it be true that time works for debility, keep to that standard much more easily.

So far as constitution is concerned the above arguments may be to some extent true, for it is probably difficult to always decide exactly when an animal is free from disease and likewise has no predisposing tendency to it. A peculiarity of constitution may manifest itself under given circumstances in a brother and sister apparently and actually healthy, and in the absence of the necessary conditions for its development they may live on till old age apparently robust. Should they be bred together they transmit by natural law in a double degree this same peculiarity which, supposing the ram to be interbred with his closest female relations for a few generations, predisposes the particular evil, whatever it may be, to pervade and become ingrained into the constitution of the whole flock. All this time it has gained strength with each generation at a compound rate, and, when the cause arises that will excite the disease, we are faced with it in a peculiarly severe and malignant form, having practically bred up to it. Should such an outbreak be of a fatal nature, away goes our flock as with a plague. If not fatal, then chronic indisposition or periodical sickness is the result. Regarding defects of the outward form the same remarks apply with equal force. Slight blemishes which are hardly noticeable at first rapidly increase until the value of the animals becomes greatly depreciated.

Most breeders who have given attention to this subject will probably agree that such are the effects to be feared from closely in-breeding, and generally will not favor such a system.

CROSSING.

How, then, can the bad effects of inter-breeding be avoided, and the character of our flock still be maintained ? The answer seems to be that we must select rams of the same breed, but different family, which possess as closely as may be those characteristics which we desire to perpetuate in our own sheep, exercising the greatest care in choosing and seeing to it that we do not draw indiscriminately on every different variety of the breed. That is to say, we must not allow of a hotch-potch mixture of broad-haired and fine wool, long and short staple, leggy and round bodied, yolky and dry woolled, etc., or we shall never attain that uniformity at which we are aiming. A fusion of many varieties cannot take place for generations, and in some cases it is impossible to get different strains of blood to mix at all.

Many men just starting to breed will experience a difficulty in reaching a satisfactory base from which to proceed, and find their sheep continue deficient in the points striven for. We may take it as an axiom that, if what is aimed at is characteristic of the particular breed gone in for, it is correct to stick to that breed if it is proved to be the right one in any given district, and keep on looking for better stock that will lift the flock on to the desired plane.

To put the question as simply as possible, suppose a man has acquired a poor rubbishy lot of Shropshire sheep and desires to obtain the quality of the best of that variety, he must get superior rams of that breed. Again, say that he wants sheep with Lincoln or Leicester characteristics, then he must necessarily go for rams of those breeds. If, on the other hand, he wishes to breed up to fine wool he must pick Merino sires, and in each case continue steadily coming on the breed he intends to predominate, increasing its blood and diminishing that which he wants to leave behind. Natural law applies all through the piece, and continuity of purpose, with care in mating, will go a long way in helping to reach the desired goal, be it wool or mutton.

Most of the finest varieties of our domestic animals are all more or less the result of judicious crossing, and with care and perseverance, there is no reason why in this country any man with natural aptitude should not achieve success from very small beginnings. Ewes of decent size and fair shape with good constitutions are readily obtainable, and with the points they lack provided for in the sire, our farmers should be able to establish flocks which, though of no great size, will be profitable to them and in no way discreditable to the sheep and wool industry of the State.

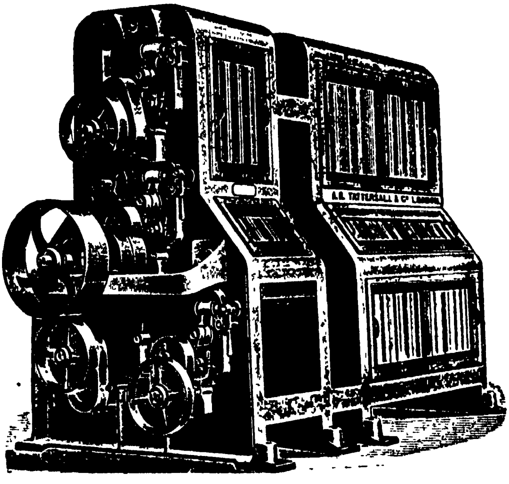
WHEATS AT THE MARCH SHOW.

MILLING AND BAKING TESTS.

By G. H. Stevens, Departmental Miller.

At the recent Autumn Show of the Royal Agricultural and Horticultural Society an innovation was introduced in the agricultural produce section, in that in four classes the wheats entered for competition were judged on the results of actually baked bread in addition to the usual points for milling, weight per bushel, and general appearance of the sample.

There were in all 18 entries in the four classes referred to, nine in the class for champion milling wheats, four in the ordinary soft wheats, one entry for medium hard wheats, and four entries in the class for general wheats. Samples of all these wheats (3bush. lots) were milled in the new Midget roller mill just recently erected at the Turretfield Experimental Farm by Mr. J. McKell (representative for A. R. Tattersall & Co., London). This mill has a capacity of 165lbs. of flour per hour. It is a great improvement on the small experimental mill previously used by the Department of Agriculture, and, when the conditioning plant which it is intended to erect is in position, the wheat treated will, in all respects, pass through the same processes as in the case of a large commercial mill. This was the first occasion on which the new milling plant was put to a practical test, and the work performed by it was highly satisfactory, the flour, bran, and pollard being in every instance quite equal to the commercial article.


A. R. TATTERSALL & Cº LONDON

Midget Roller Flour Mill Erected at Turretfield.

The department hopes, by means of this mill, to carry out some very interesting experiments in connection with the work of wheat-breeding and selection at Turretfield, and from the results already obtained it is expected that the plant will in every way fulfil the purpose for which it was installed.

In the following table we have included the points awarded for weight per bushel and general appearance in addition to those gained for milling and baking qualities, as the weight, plumpness, and general excellence of the sample have usually a direct bearing on the milling and baking tests.

TABLE I.

Variety.	Weight per Bushel.	General Appearance.	Percentage of Flour.	Ease of Milling.	Color.	Total Milling Points.	Quantity of Bread.	Quality of Bread.	Total Baking Points.	Grand Total.
Maximum points..	25	25	22	3	5	30	12	8	20	100
Champion Milling Wheats.										
1 Comeback	25	25	19·2	2	5	26 2	12	6	18	94·2
2 Cedar............	24·8	24	17·9	2	2	21·9	12	8	20	90·7
3 Bunyip	23·375	23	20·6	3	3	26·6	10	7	17	89·975
4 Crossbred 52......	22 6	21	19·2	3	5	27·2	11	7·5	18·5	89·3
5 Comeback	24 5	24	18·7	2	3	23·7	11	6	17	89·2
6 Walker's	25	21	20·9	3	3	26·9	11	4	15	87·9
7 Florence	23·5	24	19·2	1	2	22 2	11	7	18	87·7
8 Florence	21·89	22·5	19·3	2	3	24·3	11	8	19	87·69
9 Crossbred 53......	22·5	21	20·1	3	4	27·1	11	3	14	84·6
Ordinary Soft Wheats.										
1 Bunyip	22 66	23·5	18·7	3	5	26·7	10·5	7	17·5	90·36
2 Dart's Imperial ..	21	19	19·7	2	5	26·7	12	8	20	86·7
3 King's White	22·44	23	18·9	2	3	23·9	11	5	16	85·34
4 Crossbred 53......	22·47	21	20·5	3	4	27·5	10	4	14	84·97
Medium Hard Wheats.										
1 Bayah	24·87	22·5	19·3	3	5	27·3	11	4	15	89·67
General Wheats.										
1 Bunyip	21·74	23·5	19·9	3	3	25·9	10	8	18	89·14
2 Florence	23·44	24	18·8	1	2	21·8	9	6	15	84·24
3 Florence	22·44	21	18·9	1	2	21·9	10	7·5	17·5	82·84
4 Crossbred 53......	21·97	21	16·5	2	4	22·5	11·5	—	11·5	76·97

The figures in the above table speak for themselves, and there is no need to further comment on same so far as the milling is concerned.

In the baking tests the chief points for consideration were the amount of mixed liquor (viz., yeast, salt, and water) absorbed, and the weight and quality of the resultant bread.

In Table II. will be found the figures for the various flours tested.

TABLE II.

Class.	Entry.	Variety.	Weight of Flour.	Mixed Liquor Added.		Weight of Bread.	
			Lbs.	Lbs.	ozs.	Lbs.	ozs.
		Champion Milling Wheats.					
1	1	1 Comeback	25½	17	0	36	2
1	5	2 Cedar	25	16	12	36	6
1	3	3 Bunyip	25	16	2	35	0
1	9	4 Crossbred No. 53	25	16	14	35	8
1	6	5 Comeback	25	17	0	35	4
1	2	6 Walker's	25	16	2	35	12
1	4	7 Florence	25	16	9	35	14
1	8	8 Florence	25	15	6	35	6
1	7	9 Crossbred No. 53	25	15	10	35	4
		Ordinary Soft Wheats.					
2	1	1 Bunyip	25	15	15	34	12
2	3	2 Dart's Imperial	25	15	7	36	6
2	2	3 King's White	25	15	12	35	6
2	4	4 Crossbred No. 53	25	15	6	34	8
		Medium Hard Wheats.					
3	1	1 Bayah	25	15	14	35	4
		General Wheat.					
4	1	1 Bunyip	25	15	15	34	8
4	2	2 Florence	5	15	8	33	10
4	3	3 Florence	25	17	2	36	0
4	4	4 Crossbred No. 53	25	16	9	34	12

It will possibly be noted with some surprise that Dart's Imperial has shown up so well in the baker's hands. This variety as a rule is not considered a strong milling wheat, yet the baker was unable to separate it from Cedar in regard to points, both these varieties being awarded the maximum for baking qualities.

It would be a difficult matter to venture a definite opinion as to the reasons for this, especially as Comeback, which is looked upon as one of our best and strongest wheats, gained two points less in this test. A possible explanation, however, lies in the fact that a strong flour need not necessarily make the best commercial flour; in fact, it is recognised in milling circles that the best commercial flour is obtained by blending two or more varieties of wheat of different strength and characteristics. A "straight" flour, that is, flour from a single variety of wheat, does not behave so well in the oven as a blended flour, especially if it be obtained from a strong wheat, and it is probable that Dart's Imperial produces a better "straight" flour than Comeback, and this would account for the latter wheat having to take second place to it in the baking test.

Generally speaking, the above tests must be regarded as satisfactory; but there are one or two directions in which they could, in my opinion, be considerably improved and rendered even more reliable.

The present system of attaching only a cardboard tag to the bags is unsatisfactory, as in a fair number of cases the tags are lost during transit, and there are afterwards no means of identification. The number of the class and the entry should in every instance be clearly branded on the bags. Further, the present practice is to keep the miller and baker in the dark as regards the names of the wheats they are dealing with. This fact has the doubtful recommendation of ensuring impartiality in treatment, but it is a well known fact to all connected with the milling and baking trades that different varieties of wheat and flour require different treatment in order to get the best results, and for this reason it is advisable that the information referred to should be given.

The various competitors have nothing to fear from this practice, as their names need not be disclosed.

Then again, in order to ensure the best results in the baking test it is essential that the flours should have a reasonable time to cool off between milling and baking, and the longer time that can be granted between the two operations the more satisfactory are the results likely to be.

THE BAKER'S REPORT.

The department was fortunate in securing the services of a practical baker of standing so well known as Mr. Eldridge to conduct and report on the tests. The baking was conducted with the greatest care and exactitude throughout. The following is Mr. Eldridge's report :—

" In accordance with our arrangement the test of baking bread from flour supplied by Mr. Stevens, from the Government mill at Turretfield, was carried out on Tuesday and Wednesday, the 3rd and 4th of March. I have already handed you a list of the variations of the dough and bread weights, together with my marked list of the quantity and quality of the respective lots tested.

" The bread made from the class 1, entry 5, lot and the bread from the class 2, entry 3, lot were splendid samples when we consider the flour was absolutely new, all of it having been milled less than a week before the baking test. I could not separate the class 1, entry 5, from the class 2, entry 3, consequently I bracketed them equal first.

" The bread from the Bunyip variety was excellent, as also that of the Florence and Comeback varieties ; in fact, I was astonished to find that nearly all these flours—with no chance of maturing—should make such good samples of bread as they did.

" I would particularly emphasize the class 1, entry 5, variety as a very strong flour with fair color, and should say that with the advent of machinery in the baking trade bakers will have to get stronger flours to get the best results in the finished article—our daily bread. This has been borne out by the experience of the Sydney bakers. The leading bakers there are always after the strongest brands of flour for blending purposes, so much so that they have paid from £1 to £3 per ton above the ordinary market price."

SPEECH DAY AT ROSEWORTHY.

ANNUAL DISTRIBUTION OF PRIZES.

Roseworthy College was visited by a large number of parents of students and friends on Monday, March 9th, the occasion being the annual Speech Day and distribution of prizes. The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) was unable to attend, and in his absence Mr. S. B. Rudall, M.P., presided. Others present included the Director of Agriculture (Mr. W. Lowrie, M.A., B.Sc.), Messrs. G. R. Laffer, M.P. (chairman), C. E. Birks, and T. Coleman, of the Advisory Board, the Secretary to the Minister of Agriculture (Mr. W. L. Summers), Professor Osborne, and Dr. W. Ramsay Smith.

The Principal's Report.

The Principal of the College (Professor Perkins), in presenting his report, said—" On an occasion such as this, it is, I am afraid, rather difficult to avoid a 'thrice told tale,' and after some consideration, I have thought that I might perhaps, with some advantage to the institution, draw your attention to a few points bearing on the general training that we have here to offer to students. I do not disguise from myself the fact that the subject of general agricultural education is a very vexed one, concerning which the most widely divergent views are held, and which cannot very well be handled without challenging hostile criticism. In my present position, however, I must accept full responsibility for the line of training that has been adopted here ; and in the circumstances, I shall perhaps be permitted to sketch out the ideals that I have endeavored to aim at.

" Those who have given any attention to the question of agricultural education may be roughly grouped together in several sections. In the first place, there are those who are quite satisfied that the agriculturist, unlike the rest of mankind, stands in no need of special training ; that the mental operations involved in the handling of land, and its fruit, and its livestock, are so elementary in character as to be intuitively within the reach of all those who have aspirations towards a rural career. Everyday facts and ordinary common sense are so much in opposition to views of this kind that they may almost be said to carry their own refutation on the face of them, and I shall assume that the great majority of us are prepared to admit that in rural avocations, like in any other, training of some kind or other is essential to success. General agreement as to the necessity of special training does not imply, however, unanimity as to the character of the training that is to be imparted ; and in this connection it may be said that there are those who pin their faith to the purely theoretical side of the training, whilst others hold fast by what they are pleased to call 'practical training.' Now, however simple the mental effort may appear, it is no easy matter to convince partisans that both sides of the medal are essentially part and parcel of one and the same thing; or in other words, that complete training includes both theoretical and practical training, and that one cannot with advantage be separated from the other. The attempt has been made at this institution—and I believe with some degree of success—to combine both the theoretical and the practical training in those rural pursuits that appear to be best adapted to our special conditions. The credit of initiating this form of training, which has been very largely copied in other Australian agricultural colleges, is due to the present Director of Agriculture, who was for 13 years principal of the institution; and during the past 10 years I have endeavored, to the best of my abilities, to foster the original scheme, and extend its scope.

"This happy marriage of apparently divergent views appears so rational, both in principle and in the recorded facts of the institution, that it would appear almost unnecessary to dwell upon it at any further length. Unfortunately there are still many who will persist in seeing but one side to the medal, and who continue to deny all value to theoretical training; who, for instance, cannot see any connection between a knowledge of the sciences and the routine work of the average rural worker. I may be pardoned for thinking it almost incredible that such should be the case in our times. I can affirm from personal experience, and there are many who can support me in the matter, that a very appreciable proportion of those who are to-day fighting their way on the land are very keenly alive to the helping hand that is being extended to them by the sciences. They may not have had, it is true, the personal advantages of special training, but there is scarcely a day that passes that does not bring to us requests for solutions to problems that are baffling them in their everyday work. Waters, soils, manures, &c., are constantly being sent up for analysis; advice is sought as to drainage, the use of manures, tillage, diseases of crops, &c. All this is encouraging, and should weigh with those who imagine that the whole art of the agriculturist is summarised in the driving of teams and in the handling of simple implements. Nobody expects an engineer to be proficient in his art who is ignorant of the theoretical basis of his profession; why then should it be expected that ignorance and competence should walk linked together in the various agricultural pursuits?

"So much for the purely utilitarian aspect of this question, which rightly, perhaps, carries most weight with the average mind; but in the training of the mind of the rising generation there are other issues at stake of equal importance to be considered. A study of the 'why' and the 'wherefore' in the routine of daily operations, of the principles which underlie practice, besides opening the road to improvement in inherited routine, reacts on the mind, broadens it, and extends the horizon of our thoughts to a degree that can be appreciated in after life only by those who have had the privilege of early training. It is generally recognised that throughout the civilised world one of the most difficult problems of modern times is represented by the gradual desertion of rural districts and the corresponding congestion of urban areas; and in Australia this problem is quite as acute as elsewhere. I must freely admit that at times—and particularly in the old world—economic conditions are mainly responsible for this abnormal condition of affairs; in Australia, however, I am inclined to think that educational factors, or rather the neglect of them, control the position. We are possessed of enormous tracts of unoccupied or only sparsely occupied country; we are very far yet from the stage of gigantic industrial operations; indeed, in spite of the astonishing progress of recent times, we are not yet out of the stage of early settlement; and yet we know that there is unrest in the country districts, and that the city throws off its unemployed units most grudgingly. I know that it is often stated that it is the drab monotony of country life which is the deterrent, whilst the sociability and amusements of the city form the magnet which continue to lead to this modern patch-work settlement of a country. And by whom is it that country life is deemed so monotonous? Solely by those, I think—the majority, perhaps, at the present time—who can see in country work nothing more than a series of routine operations repeated year after year without change. Is it necessary to add that this need, indeed should not, be so? If the man on the land were educated on the lines that I have indicated, he would realise that his work is as interesting, as intellectual as that of the most exalted of professions. He would have open to him the pleasures of the imagination, of the intellect compelling matter; and the glamour of the city would be powerless against the attractions of saner and healthier occupations. With particular force does this apply to the smart country lad who has become conscious of natural ability, and who chafes at the prospect of seeing it wasted in the dull routine of manual operations. Let him but understand that behind this apparent routine there is scope for the play of as much intellect as in any other occupation, and in the majority of cases he will remain true to his early surroundings.

"We are celebrating to-day the thirtieth occasion on which College diplomas have been distributed—and I have pleasure in thinking that I have taken part in 23 similar functions. During the 32 years of its existence the College has seen 596 students on its rolls; and of these, after to-day, 217 will have been awarded the College diploma. I suppose it would be idle to expect that all alike have benefited to the full by the training we have to offer. Many, we know, have in their after careers done exceedingly well; they are now scattered all over the States; and we entertain the hope that they may prove effective missionaries of the advantages of agricultural training.

"I may now pass on to the immediate objects of this meeting. I must, in the first place, extend my heartiest congratulations to the gold medallist of the year, Mr. H. A. Follett. He has done exceptionally well; his general average, 90·3, is three decimals better than that of Mr. C. F. Stephens, whose own average represented a record in 1913. Mr. Follett has also taken honors in every subject, and won every prize but one that was open to him. I trust he may prove equally successful in after life. I must also congratulate Mr. L. J. Clark, who is to be awarded a diploma of the first class. Third-year students, as a whole, are also to be congratulated on their mean diploma average, which is 70·7 per cent.

"The thanks of the institution as a whole are due to those gentlemen who have very generously presented prizes for competition; I can assure them that their generosity is highly appreciated by staff and students alike.

"To those who are leaving us, I would say that they carry with them my best wishes for their future welfare and success. I hope they leave us well equipped for the battle of life; we have done our best for them, and trust they will prove a credit to the institution."

Diploma and Prize List.

The diploma and prize list was as follows:—

Diplomas (in Order of Merit).

Diplomas of the First Class.

Henry Arthur Follett, with honors in agriculture, viticulture, œnology, fruit culture, wool-classing, surveying, chemistry, bookkeeping, aviculture, and dairying.

Leslie James Clark, with honors in agriculture, viticulture, and dairying.

Diplomas of the Second Class.

Morris Hains, with honors in surveying.
Alfred Frank Harper, with honors in surveying and wool-classing.
Howard George Mortimer.
George Rolfe Webb.
Philip Anstruther Tod, with honors in wool-classing.
Robert Cyril Hardy, with honors in wool-classing.
David Hatton Killicoat, with honors in wool-classing.
Leslie Durnell Tillotson Jarman, with honors in wool-classing.
Sophus Carl Vohr.
Robert Reid Bartholomaeus.

Diploma of the Third Class.

John Tinline Murray.

Prize List.

Third Year Students.

Gold medal (presented by the Royal Agricultural and Horticultural Society for the highest aggregate in all diploma subjects), Henry Arthur Follett.

College second prize, Leslie James Clark.

Old Student's Cup (presented by the Old Students' Association for highest aggregate in agriculture and veterinary science), Henry Arthur Follett.

Fruit culture prize (presented by the Albert Molineux Memorial Trust), Henry Arthur Follett.

Special prize (presented by the members of the Advisory Board of Agriculture for the highest aggregate in all practical examinations), Henry Arthur Follett.

Ploughing—Special prize (presented by Professor Lowrie for the best ploughman), Leslie Durnell Tillotson Jarman.

Oenology prize (presented by Professor Perkins), Henry Arthur Follett.

Chemistry prize (presented by Mr. J. H. Phillips, B.Sc.), Henry Arthur Follett.

Viticulture prize (presented by Mr. H. E. Laffer), Henry Arthur Follett.

Veterinary science prize (presented by Mr. F. E. Place, M.R.C.V.S.), Henry Arthur Follett.

College prize for best outside work, Henry Arthur Follett.

Sports prize for highest batting average, J. T. Murray.

Second Year Students.

Silver medal (presented by Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.), Oscar Sturt Symon.

College second prize, Francis Henry Ough Dealy.

Agriculture and Farm Diaries (prize presented by Professor Perkins), Oscar Sturt Symon.

Viticulture (prize presented by H. Buring, Esq.), Oscar Sturt Symon.

Fruit culture (prize presented by Mr. H. E. Laffer), Oscar Sturt Symon.

College prize for best outside work, Herbert Henry Orchard.

Veterinary science (prizes presented by J. P. Richardson, Esq.)—(1) Oscar Sturt Symon; (2) Herbert Henry Orchard.

First Year Students.

Silver medal (presented by A. L. Brunkhorst, Esq.), Thomas Sydney Ough Dealy.

College second prize, Stuart Gawler King.

Agriculture and Farm Diaries (prize presented by Professor Perkins), Thomas Sydney Ough Dealy.

Botany (presented by Mr. A. J. Adams), Thomas Sydney Ough Dealy.

Bookkeeping (prize presented by Mr. H. C. Pritchard), Thomas Sydney Ough Dealy.

English (prize presented by Mr. A. J. Adams), Thomas Sydney Ough Dealy.

College prize for best outside work, Bryant Charles Hamilton.

THE SPEECHES.

Speeches appreciative of the work of the College were delivered by the Chairman, Mr. Laffer, M.P., and Mr. A. J. Follett, after which Mrs. Rudall distributed the prizes.

EXTRACTS FROM TRADE COMMISSIONER'S REPORT.

Under date London, February 6th, the Trade Commissioner reports, *inter alia*—

BRITISH DAIRY FARMERS' ASSOCIATION.

As I previously advised you, there were several matters that I intended bringing before the council of this association when they were discussing the arrangements for the next dairy show. I am pleased to report that each of the lines that I proposed were considered yesterday at the committee and council meetings, and each one went through satisfactorily.

Bacon.—I pointed out that while the industry was only in its infancy it was hardly fair to expect the colonies to compete with the United Kingdom in this line. I have now arranged that there will be a distinct class for bacon produced in the dominions beyond the seas, apart from the class for that produced within the United Kingdom. There will be three awards in each class, and, of course, the colonial will still have an opportunity of competing for the trophy, which will be considered as a sort of champion prize.

Butter.—In the past there was only one class for both Australian and New Zealand butters. This we have now made into two separate classes—one for Australia and one for New Zealand—so that the Australian will not now have to compete with New Zealand. The chief object in bringing this before the council was that in previous years the New Zealand butter has been staged in the original boxes which, as you are aware, are of a different shape from the Australian, and, while I have no reason or desire to cast any reflection on the judges or on the New Zealand butter, at the same time it was not fair competition that the judges should know by the boxes beforehand where the butter came from. This difficulty will now be obviated by the fact of having two distinct classes.

Honey.—I have also arranged to have two distinct classes for honey—one for honey produced within the United Kingdom, and one for honey produced in the dominions beyond the seas. The competition will be open to *bona fide* producers only, and not to merchants or associations; and in order to prevent the prize being taken by mere "pot-hunters," each exhibitor must produce a Government certificate to the effect that he has a commercial quantity (say 5 tons). I was prompted to have this clause inserted in order to prevent anyone who might have a small patch of clover, or something of that kind, competing, and who at the same time would not be likely to have any sort of a commercial quantity. I sincerely trust some of the leading apiarists in South Australia will enter for this competition at the next show. Full particulars will be forwarded later.

The majority in the first instance were opposed to creating any further classes. As a matter of fact, some of the principal members of the council are beginning to eye with a certain amount of suspicion the continual increase in colonial classes. Although this is the British Dairy Farmers' Association, it is not British in the full sense of the word, and I am afraid the average farmer in the United Kingdom is not altogether imbued with the imperialistic spirit.

For some years past I have called attention to what I have considered an impossible feat on the part of the judges. There has only been one judge for the salted class and one for the unsalted, and I have maintained that it is a physical impossibility for one man, single-handed, to properly judge such a large number of boxes and keep his palate to the last. This question is to be brought up at the next council meeting, when I have every reason to believe the number will be added to. I intend proposing that there be three to each class.

AMERICAN VINES AND THEIR HYBRIDS.

By H. E. Laffer, Lecturer on Viticulture and Fruit Culture, Roseworthy Agricultural College.

Throughout North America there are a great number of wild species of Vitis, whose value lies in their greater or less degree of resistance to phylloxera. In their own country certain of these have been improved by cultivation as regards their fruit, but not sufficient to seriously challenge the position of the European vine (*Vitis vinifera*).

PHYLLOXERA-RESISTANT VINES.

Consequent upon the outbreak of phylloxera in France, about 1860, once the origin of the mysterious malady was established, investigation proved that it had been introduced upon American vines, and also that these same vines were resistant to the effects of the attack. The natural outcome of this discovery, failing eradication of the disease, was to establish or reconstitute vineyards upon resistant American stocks.

In an undertaking of this description it was only natural that many errors were committed at the outset, and it may safely be said that France is only now overcoming the results of those early mistakes. At the present day it is recognised that there are two controlling factors which make for success in grafting phylloxera-resistant vines. First, there is the adaptability of the stock to local conditions of soil and climate, and, secondly, the amount of affinity existing between the stock and the scion, and upon which the success of the union depends. On the former will depend the vigor and strength of the vine, and on the latter its health and length of life in a profitable condition. It is an established rule that the nearer the stock and scion are akin in botanical and physical characters the healthier and longer lived will the plants be.

It was mainly owing to lack of attention to these details in the early years of reconstitution that many costly mistakes were made. The fact of a vine exhibiting a sufficient degree of resistance, coupled with a successful graft, was considered sufficient, and it was not until some years later that the need for other qualifications was realised.

In the meantime considerable attention was being paid to the question in various directions, and the number of stocks at the disposal of the vigneron was enlarged. Probably the two American species of Vitis most universally employed at this period were Riparia and Rupestris. Although they were readily grafted with Vinifera they did not adapt themselves to soil conditions, and so ultimately failed as graft-bearers. Needless to say, these mistakes were exceedingly costly to those concerned, as it entailed the replanting of large areas for a second time within a comparatively short period. Other stocks of pure American species were tried with but little permanent success, and of these *Vitis berlandiere* may be instanced. This vine appeared to be of very great value, as representing a species which flourishes in soils containing high percentages of lime, characteristic of a great deal of the northern districts of France. Unfortunately it was grafted only with difficulty and struck root badly from cuttings.

A VALUABLE DISCOVERY.

During this period of experimental work another factor established itself, and proved to be one which was to go a long way towards solving the difficulties previously experienced. This was the production of hybrid vines and their extensive propagation. There can be little doubt that the benefits derived from these hybrids were indirect to the original object of their production. That is to say, the first idea of artificial hybridisation was to create a vine of European-American parentage which would combine the chief characteristics of both parents—resistance to phylloxera and production of fruit of good quality and value.

That this object was at any rate partially achieved is evidenced to-day by certain types of resistant vines known as direct producers. The indirect outcome of the practice is, however, the most important, for we have a number of graft-bearers possessing ample resistance to the disease, and which through their partly European parentage unite more readily with the Vinifera scion.

Success in this respect opened up further fields for experiment, and hybrids of chosen American species, and in some cases double hybrids, were established in addition to those of Vinifera-American parentage. The outcome has been that many of these vines at the present day promise to very largely eliminate the original difficulties. One can hardly maintain that the problem is solved, but the fact remains that the solution is very much nearer at the present day than ever it has been. The creation of hybrid stocks is carried out on scientific lines, choosing parents adapted to certain conditions of climate and soil, and endeavoring to transmit these characteristics through the progeny. Thus we find that instead of taking one or two stocks and adapting them to all soils, conditions, and scions, there are now a number, each of which displays some qualities of special value for certain conditions under which it is to be utilised.

With the spread of the disease throughout the world, the field of experiment has been enlarged by the inclusion of results from South Africa and the eastern States of Australia. An examination of the collective experience of these countries demonstrates how few of the pure American species are giving satisfaction at the present time, and how the propagation of the hybrids has extended.

We must not lose sight of the fact that probably no grafted resistant vine will prove so long-lived as the old Vinifera under good conditions, as the effect of the graft is to create a weakness in the compound plant. The life of such a plant depends largely upon the success with which the stock and scion unite, and experience goes to prove that in most cases the hybrid vines graft more readily than the pure species. Therefore it would appear, apart from the question of adaptability to soil, that scions grafted upon these hybrid stocks may reasonably be expected to give better and more lasting results.

As in the early years of reconstitution, Europe, and particularly France, did the main part of the work, those countries which became infected at a later date were enabled to reap the benefit of what had already been done. Thus we find South Africa, Victoria, and New South Wales drawing supplies of the various tested stocks from France, and propagating them according to their adaptability to conditions in these countries.

A UNIQUE POSITION.

South Australia is in a unique position in so far that for some thirty odd years the disease has been devastating the neighboring State, and assuming, as is only reasonable, that at some time it will be found within our own borders, the work being done by the Viticultural Department of Victoria will be of inestimable value as a guide to our proceedings.

Although from time to time we have arguments advanced as to the introduction and propagation of resistant vines into South Australia in order to be prepared, yet, for reasons which will be referred to later, such a procedure may be characterised as exceedingly unwise and unnecessary.

EXPERIENCE OF OTHER COUNTRIES.

Looking at the experience of South Africa and Victoria we find how few stocks have proved really effective over a general range of conditions. Further, we find that, taking the conditions of Europe in conjunction with these others, the stocks which find greatest favor are more or less identical in all three. Such a condition only limits the field of experiment to a further extent and emphasizes the fact that the way is being smoothed for countries which may become infected in the future.

In South Africa we have the country with longest experience of phylloxera in the Southern Hemisphere, and its experience should serve somewhat as a guide to Australia. The qualifications of the various resistant stocks has been exhaustively dealt with in a bulletin published by the Viticultural Department under Messrs. Perold and Tribolet, and, taken on the whole, similar results have been obtained by the Victorian department under Mr. F. de Castella.

South African experience tends to show that no matter what the degree of resistance may be, if the vines are permitted to become weak by excessive cropping they will succumb to the attacks of the disease. This is a possibility which must be guarded against, as, at the present time, the young reconstituted vineyards bearing in Victoria are fruiting very heavily in comparison to the old vineyards. This, however, may not be a true comparison, as these young vineyards are being planted under far better conditions as regards preparation of the soil than were the old ones, a factor which should materially increase the vigor and fruit production. However, in view of the possibility of over-bearing, a proper ratio must be preserved between wood production and fruit production.

GRAFT-BEARING STOCKS.

In examining the various graft-bearing stocks, we may for convenience divide them into—(1) Pure American species of Vitis. (2) Hybrids of two American species. (3) Hybrids of Vinifera and American.

In the first place, what constitutes a hybrid vine ? The vine is included botanically in the natural order of *Ampelideæ.* This natural order is divided into a number of genera, and the one which is of interest to us is the genus Vitis. The genus Vitis is again divided into numerous species, which include all the wild types of vine in different portions of the globe. Thus we say that the European vine is of the genus Vitis and species Vinifera (*Vitis vinifera*). Of the American species we have *Vitis riparia, V. rupestris,* &c. All these species in their native state preserve their distinctive features, but may be artificially cross-fertilised, producing in the progeny or hybrid a combination of the characters peculiar to both parents. The characters of one or the other may predominate according to circumstance.

PURE AMERICAN SPECIES.

Of these the first to be utilised to any extent were the Riparias, of which there are two main types or varieties.

1. *Riparia Grand Glabre.*—This vine was resistant to a high degree, but failed in the reconstituted vineyards owing to lack of durability in the graft, usually shown by the scion growing away from the stock and exhibiting an appearance somewhat like an inverted bottle. It has now been generally discarded in Europe, South Africa, and Victoria.

2. *Riparia Gloire de Montpellier.*—Like the former, this stock lacks durability, and has been abandoned in Europe and Victoria. In South Africa it is still used to a certain extent in some of the deep, rich soils, but, in view of the fact that there are several more durable stocks available for like conditions, it is a question as to whether there is any justification for retaining this one.

The next species in importance was *Vitis rupestris,* and the two varieties gave but little better results than did *V. riparia.*

1. *Rupestris du Lot.*—This stock is giving fair satisfaction on the better class of soils in Victoria, but is not used to any extent in South Africa, giving place to those which have proved more suitable.

2. *Rupestris Metallica Cape* was at one time well favored, but is giving way before the better varieties of stock. *Vitis berlandiere*, which has already been referred to, had to be discarded owing to difficulty of grafting and rooting cuttings.

These vines represent the main species, and it will be seen that in no case have they proved satisfactory. Yet these same vines hybridised have given some most promising stocks, as instanced by the following examples.

AMERICAN HYBRIDS.

As is usual in such circumstances where great numbers of seedlings have to be dealt with, numbers are made use of to distinguish one from another. The names in brackets indicate the parentage.

Nos. 3306 and 3309 (Riparia x Rupestris). These two stocks appear to be of considerable value in the reconstitution of European vineyards. In Victoria they are giving general satisfaction in a variety of soils. In South Africa there is no mention of them unless under an obscure name.

No. 3306 does best in the heavier types of land and, in addition, adapts itself to irrigated soils, exhibiting considerable resistance to root-destroying fungi as well as phylloxera.

No. 3309 appears better suited to hill slopes and sandy soils, and for these conditions is a valuable stock.

Nos. 420A and 420B (Berlandiere x Riparia). These are said to be excellent stocks; hardy, drought-resistant, and heavy fruit producers.

Nos. 301A and 301–64 (Rupestris x Berlandiere) are also stocks which give much promise.

Among other promising hybrids which are being tested, the following may be mentioned:—No. 34E (Riparia x Berlandiere), No. 601 (Bourrisquou x Rupestris), No. 125-1 (Cordifolia x Riparia), No. 106-8 (Riparia x (Cordifolia x Rupestris), a double hybrid. These two last, through their Cordifolia parentage, adapt themselves to the heavy clay lands.

VINIFERA-AMERICAN HYBRIDS.

Among this section of graft-bearing resistant stocks we find many which are most popular, being readily rooted and grafted, as well as being resistant to phylloxera. One group of these hybrids worthy of special consideration is that known as A.R.G., the vines being a hybrid of Aramon (Vinifera) with Rupestris Gangin (American), and there are three of them (A.R.G. 1, 2, and 9). In South Africa these stocks are referred to as Aramon, but must not be confused with their Vinifera parent so largely grown in the South of France, All these stocks are hardy, but No. 1 most so, proving of great utility under a variety of conditions of soil and climate; in fact, with the exception of dry hill slopes it appears to adapt itself to almost any locality or soil. It is most popular in Europe, and particularly in Spain. It appears to suit the strong-growing scions, such as table grapes. In Victoria it is highly spoken of, being hardy, resistant to phylloxera, and adapts itself to irrigated land or soil with defective drainage. The remaining members of the group are not so good as No. 1, though they have a certain popularity.

No. 1202 (Mataro x Rupestris).—This vine shares with A.R.G.1 and 3306 the resistance to defective drainage, and adapts itself to irrigated lands. It is, however, more drought-resistant than either of these, as might naturally be expected from its origin. It is found to be a good stock for bad scions such as Mataro and Doradillo. There can be little doubt that for much of our South Australian vine country this should prove a most useful stock.

No. 41B (Chasselas x Berlandiere) represents that type of the American vine thriving in soils of a limestone nature. It is hardy and drought-resistant, grafts and strikes root readily. It is strong and vigorous, and should prove one of the most suitable stocks for South Australia in event of the necessity arising for its propagation.

In addition to these stocks, there are others which promise to be of great use, but at the present time they have not been sufficiently tested to give any conclusive results. It is sufficient for the time that there are a number of stocks, tested under a diversity of conditions, and which up to the present are proving to be all that was expected of them.

AN UNWISE SUGGESTION.

It serves to impress the fact that for South Australia to repeal the existing Phylloxera Act and undertake propagation of resistant stocks at the present time is both unwise and unnecessary. Unwise, in that to temper with existing laws opens the door for the promicsuous introduction of vines, a danger which cannot be too carefully avoided. Unnecessary, because Victoria is forced to do the work and is in a position, not circumscribed by quarantine laws, to do it properly. Such an undertaking would necessitate an increase in the phylloxera tax to meet expense, and all for no compensating advantage. At present the serious propagation of stocks is confined to Victoria, and South Australia desires nothing better than that the existing conditions may continue.

In conclusion, I must acknowledge my indebtedness to Mr. F. de Castella for the opportunity of inspecting the propagation nurseries at various times, and also for general information regarding the respective stocks.

POULTRY NOTES.

By D. F. Laurie, Poultry Expert and Lecturer.

OPERATIONS FOR APRIL.

We are now at the turn of the season. Theoretically we have the four conventional seasons, but actually we have warm weather, and from April to, say, September we have cool weather with more or less rain. Except for the production of green fodders, regular rainfall is not of vital interest to the poultry breeder—that is directly. The advent of cold, wet weather, which we all hope soon to experience, should warn all poutry-breeders of the need for providing adequate housing accommodation. Housing is an absolute essential. The average man, in town or country, can afford to erect proper yards and houses. He need be in no doubt as to what to build, because he can write and ascertain.

Modern Stock.

At this time of the year our breeders have large numbers of high-class utility poultry to dispose of. Now is the time to buy. If you delay you will get the residue—the best will have been sold—or you will get none. It may save time and trouble if this fact be noted. Good utility stock, which alone is profitable, is the result of hard work and brains. There is a demand for this, and you cannot purchase such poultry at the price of farm "scrubs." For egg-production only there is but one breed which has stood the test, and that is the laying strain White Leghorn.

All-Round Breeds.

The generally inferior quality of the table poultry available for our markets warrants greater attention to the all-round breeds. These, which include Wyandottes, Orpingtons, Plymouth Rocks, Rhode Island Reds, &c., are all good average layers, and the chickens, if sold young and in prime condition, will afford a supply of superior table birds. If we are able to boast a little about our egg-production and the large sum paid to us for our surplus eggs we must certainly hold back when table poultry is the theme. There is an excellent and profitable market, and breeders should take note.

Early Breeding.

Out of season—very early—table poultry, young and fat, will command high prices until about Christmas. To get the best prices you must hatch early. Autumn hatching has been recommended by me for years, and those who follow my advice find it very profitable. There is ample scope for all breeders.

VERMIN.

During the winter on many farms there will be need of firewood during the cold weather. Let every owner of tick and vermin (generally) infested stables and fowlhouses burn these plague spots and erect new sanitary houses. It is a marvel to me to note the complacent attitude of owners of vermin-infested premises. Much might be said that must remain in thought alone.

ARTIFICIAL INCUBATION.

Although there are thousands of incubators used in this State there are still many people who are in doubt as to their utility. You can buy either imported or well-made reliable locally-made incubators. In breeding for egg-production a gradual process of selective breeding is making the supply of "broody" hens very short. To make poultry-breeding profitable you must be in the position to hatch at a given date, so that you can have birds of a certain age at the time desired. This you cannot rely upon if you depend on broody hens. I cannot, of course, recommend any particular make of incubator, but as a rule it is wise to select well-known and well-proved makes.

THE MARCH SHOW.

I was disappointed at not seeing a number of country friends interested in poultry-breeding. The poultry exhibit in the departmental court was full of interest, and I should have welcomed more country friends. The chief point of interest was the mammoth incubator of 5,200 eggs capacity, which the Hon. Minister of Agriculture has authorised for Parafield Poultry Station. This machine is built up of six sections which are double, and each holding some 800 odd eggs. The heat is supplied by a coke oven furnace which heats a water-pipe service. The heat of the oven is automatically controlled by the expansion of water. Each section of the incubator is also automatically controlled by an ether capsule actuating a rod and valve, thus controlling the hot water heating supply. Each unit has four egg trays, which are reversible and interchangeable. There are two sets of egg trays for each unit, and the turning of the eggs is done in a few seconds by these means. The cost of running these mammoth machines is less than a seventh the cost of kerosine-heated machines, and there is no danger from fire, nor are there any objectionable fumes as from kerosine. To Mr. D. Lanyon, the well-known incubator manufacturer of Kent Town, was entrusted the task of building what is the first of its kind in the State. The general appearance and workmanship are most creditable, and show what can be done in the

State. The machine will be housed in a special room to be built at the Parafield Poultry Station, where visitors can, after June, inspect this modern method. A large part of the plant there is heated by air gas, and I shall also run a few small machines by kerosine to demonstrate the three methods. Here one will find brooders of several types suitable for small or large operations. Mr. Buchan, of Renmark, who is erecting a large poultry plant, is installing a 1,200 egg mammoth incubator, also a mammoth brooder 40ft. long, worked on the same principle.

PARAFIELD POULTRY STATION.

There are two public visiting days at Parafield each month, and large numbers avail themselves of the opportunity to inspect the plant, stock, &c., and learn the methods adopted. On March 28th over 100 persons, including several ladies, paid a visit and spent an interesting afternoon. The public single testing to be carried out this year is attracting much attention, and will prove a great help to our breeders. The work of building is going ahead, and there is much of interest to show each month. Parafield is an observation school to hundreds who wish to house and treat their birds to the best advantage.

PARAFIELD LAYING COMPETITION, 1913-14.

FINAL REPORT (Abridged).

By D. F. LAURIE, Government Poultry Expert and Lecturer.

The abridged report now presented refers to the tenth competition held in this State. The first was held at Magill, the following eight at Roseworthy, and the tenth at Parafield. In the first test there were 156 pullets competing, in the tenth there were 900. There were also three competitions held at the Kybybolite Poultry Station, and some excellent results were obtained. As usual, a full report will be issued in due course. This will contain several special paragraphs of practical and scientific interest; also a complete table showing the monthly and total egg production of each pen. The full report may be had later on application to the Poultry Expert, Adelaide.

How the Birds are Fed.

Only grain of the best quality, as well as bran and pollard, are used. It is a mistaken policy to buy inferior or damaged foodstuffs. Where standard quality is concerned, one may accurately gauge the quantities required and the results to be expected. All foods are purchased at current market rates. No condiments of any sort are used.

Morning.—At 7 a.m. the first meal of the day is served out. This is fed in earthenware pans. Never throw mash on the ground. The average proportions of the morning mash are pollard two parts, bran one part (by bulk), and lucerne hay chaff. Meat meal at the rate of ¾lb. per 100 hens is made into soup which is used for scalding the bran and lucerne chaff. These are then dried off with pollard until a crumbly mass results. Hot soup is only used during cold weather. In the hot months—from September to March—the meal may be mixed with cold water. A handful of salt per 100 hens is added to the liquid used in moistening the mash. The quantity of mash averages from 4ozs. to 5ozs. per bird, according to appetite. The food is mixed by hand. I have not yet seen a mechanical mixer that would suit the purpose. A proper consistency of mash is of the utmost importance. Slovenly methods soon tell their tale in the unthrifty appearance of the stock. The exact amount of food required by a pen of birds depends on circumstances. Observation alone will show this. If the food is not all eaten, say, within a quarter of an hour, the balance should be removed. Should the birds require more food they should have it. As the yards are floored with straw in which the grain is scattered, there are no idle moments for hungry fowls. As soon as it is light enough in the morning for the birds to see they leave their sleeping quarters, and are soon busily scratching in the litter for grain left over from the previous day. This exercise promotes digestion and keeps the birds warm in cold weather. When the morning feed arrives they are ready for it, but there is no rushing and excitement.

Noon.—At midday green food, chaffed, is fed at the rate of about 2ozs. per bird. The amount may be increased so that the birds have as much as they will eat. Green food is of the utmost importance as a food. It has also important functions in assisting various processes of digestion, and reactions on the blood. Grains and seeds generally are deficient in salts and minerals. These valuable food constituents are well represented in green foods. Green food for poultry should be fresh and succulent. Stale green food, or old, tough, fibrous growths are of little value, and may even be harmful. For Australian conditions lucerne is the most valuable of all green foods. It grows readily in most localities, and under good conditions of soil and treatment will give enormous yields. Berseem (Egyptian clover) introduced to this State by the Principal of the Roseworthy College, is a most valuable green fodder for poultry. As a rule lucerne yields little after

April. Berseem sown in March and well irrigated will give a succession of cuts yielding enormous quantities of succulent green food highly relished by the birds. With the advent of the warm weather it is advisable to plough in the remains of the berseem, and prepare the ground for other crops. Barley, oats, and rye all make good winter crops, but must be cut young, not when tough and stringy. Kail, including thousand-headed, Jersey tree, and French (chou moellier), are exceedingly valuable. They should be planted out in rich soil and irrigated. The thick stalks of the French kail are hollowed out by the birds. Silver beet affords a large supply of excellent food in spring and summer, and is much appreciated, especially by young stock. Sprouted oats have been tried, but many of the birds did not approve of them. Sprouting grain, *i.e.*, just germinating, contains various proteins of considerable food value, but must be used with discretion. Succulent green food can be grown by most South Australian breeders. If green food is not available, or the supply is short, the birds should have a little grain thrown into the litter at midday. On the whole, the system of feeding chaffed green food is preferable to giving it loose as cut from the plot. The birds eat practically all the green chaff. Lucerne hay which has been well made, if chaffed and scalded, adding a little salt to the water, makes a splendid substitute for green food. All breeders should stock lucerne hay chaff. Our fodder merchants do not stock this valuable food as a rule. If, however, breeders made a persistent demand, no doubt arrangements for regular supplies would be made. One-third of the bulk of a fowl's food may be vegetable—green or cured—and with ducks the proportion may be one-half. Not only are better results obtained, but at a lower cost. Green food and lucerne hay chaff are cheaper than grain and mill by-products.

Evening.—According to the time of the year, from 4·30 to 5 p.m. witnesses the feeding of the third and last meal. This is always in the form of grain, generally wheat. In cold weather peas, maize, and short, stout oats may be fed with great advantage. The average quantity is 2ozs. per hen. The grain should always, as at the poultry station, be well scattered in the scratching litter. This prevents the birds overloading their crops, because they have to scratch and hunt for the grain and eat slowly. As a rule there is enough left in the litter to tempt the birds to early activity next morning. When other grains—oats, peas, maize, &c., and a little barley occasionally—are obtainable at reasonable rates, it is policy to feed them, because variety of food is most desirable.

Other Essentials.—I maintain that a good supply of clean scratching litter in the yards, and where possible also in the houses, is the keynote to success. Busy birds are generally healthy, contented, and productive. Birds must have exercise, and they get more under these conditions in small yards than they do where the range is unlimited but with no scratching litter.

Water.—In cool weather the drinking vessels, after careful cleansing, are filled daily. In hot weather the supply is renewed as required. This point is regarded as of great importance. The body, as well as the egg of a hen, contains a large percentage of water. Fowls require a large amount of water, especially on hot days. Particular attention must be paid to the cleansing of the water vessels. These must be scrubbed—a mere rinse out may leave the trouble behind in the vessel. The water vessels should be shaded from the sun ; sun-heated water leads to trouble.

Grit.—Three kinds are used—hard quartz and shell grit—both of these are much sought after by the birds ; the third is charcoal grit. I have used charcoal grit for 30 years, and have advocated its use from the newly-hatched chicks onwards. It is invaluable as an antacid. Where used sickness is rarely encountered. The grit should be kept in a hopper or trough in the house and sheltered from the wet. Wet charcoal loses much of its absorptive power.

Medicating the Water.—Sulphate of iron in the form of Douglas mixture is commonly recommended. One writer after another has copied the instructions, and I also did. Some years ago the fact struck me that the amount of iron in the organism is so small that the administration of large quantities was a mistake, because, beyond an infinitesimal amount, none would be absorbed. Then it seemed that organic iron would be far more suitable to use, and I am not convinced at all by those experimenters who claim that inorganic iron is as effective as that of organic origin. Douglas mixture—ferrous sulphate and sulphuric acid—may be used sparingly in either the drinking water or for mixing in the mash. The sulphates of soda and magnesia—Glauber and Epsom salts—are of very great value for poultry. In both these sulphur is held in chemical combination, but in the system splits up and performs valuable offices. The sodium sulphate (Glauber salts) is more expensive than the Epsom, but it is a more valuable substance. In laying hens the action on the intestines is gentler, and the influence on the oviduct is most beneficial. The blood is alkalinated also. It is a good plan to mix a stock solution—4ozs. to 1 pint of hot water. Of this use a teaspoonful to each quart of drinking water. Epsom salts has its value also, and may occasionally be used; its use is indicated in hot weather as a cooling agent. One ounce dissolved in the water used for mixing the mash of 20 hens, once a week, is sufficient. These salts are useful in outbreaks of chickenpox. After the morning meal is eaten all pens are cleaned and turned over ready for next day. Great care is exercised in regard to cleanliness. Success in poultry-keeping depends largely upon the power of observation on the part of the attendant. The various processes in connection with feeding should be carried out quickly, but not perfunctorily. A quick glance should note the appearance of each bird at feeding time. A bird "off its feed" needs examination.

THE GENERAL AVERAGE.

The average egg-production for the three sections, equal 900 hens, is 178·48. Last year the general average for 804 birds was 182 per hen.

The cost of feeding each hen was 5s. 3·8d. this year, as compared with 5s. 7·8d. last year—a difference of 4d. a bird.

The profit over cost of feeding per bird is 9s. 2·9d. compared with 10s.10·2d. last year. The contributing causes are as follows:—An abnormal season, which resulted in a long period of moulting. During March the heavy moult caused a great reduction in the number of eggs laid. For the period April 1st, 1913, to March 31st, 1914, the average price of eggs per dozen in the Adelaide market was only 11·74d., compared with 13·08d. last year. This considerable fall in the average price of our eggs points strongly to the fact that, despite interested statements to the contrary, we must soon send part of our surplus to oversea markets, where the price is higher than in Adelaide at the glut season. Another factor to be reckoned with is that 19 pens were for a considerable period one bird short, and two pens had two birds short, and one had three birds short. The total shortage can be best expressed as 1,420 egg days, *i.e.*, that a maximum addition of 1,420 eggs could have been made, thus largely increasing the general average. These shortages were due to deaths and incapacitated birds occurring at a period when the scores were so far behind that there was no hope of winning a prize; still, the effect on the averages is considerable.

BREED AVERAGES.

The average production of 750 White Leghorn hens is 184·4. Last year the average production of 618 White Leghorns was 191·3. The next highest breed score is that of the White Wyandottes, viz., 181·5. This variety of Wyandotte I have recommended as a fine all-round fowl for farmers and others.

BREEDS AND AVERAGES.

No. Pens.	Breed.	No. Birds.	Eggs Laid.	Aver. per Hen.	Aver. per Pen.
125	White Leghorns	750	138,306	184·4	1,106·4
1	Brown Leghorns	6	724	120·66	724
14	Black Orpingtons	84	12,992	154·66	928
3	Silver Wyandottes	18	2,574	143	858
2	Black Langshans	12	1,901	158·41	950·5
1	Buff Orpingsons	6	799	133·16	799
1	White Wyandottes	6	1,089	181·5	1,089
1	Black Minorcas	6	819	136·5	819
1	Faverolles	6	731	121·83	731
1	Dorkings	6	704	117·33	704

SUMMARY OF RESULTS.

Number of pens	150
Number of hens	900
Total number of eggs laid	160,639
Total value of eggs laid	£655 7s. 2d.
Total cost of feeding	£239 9s. 6d.
Profit over feeding	£415 17s. 8d.
Average market price of eggs per dozen	11·74d.
Average number of eggs laid per hen	178·48
Average number of eggs laid per pen	1,070·9
Average cost of food per pen of six hens	£1 11s. 11d.
Average cost of food per hen	5s. 3·8d.
Eggs laid by winning pen, Section I.	1,444
Eggs laid by winning pen, Section II.	1,222
Eggs laid by winning pen, Section III.	1,330
Highest average per hen	240·66
Highest score per pen	1,444
Profit over cost of food per pen	£2 15s. 5¼d.
Profit over cost of food per hen	9s. 2·9d.

FOOD USED.

The following quantities, varieties, with cost of each, will show the expenditure incurred during the year:—

			£	s.	d.
Wheat	688¾ bush.	at average price 3s. 6d. per bush.	120	10	7
Pollard	950½ bush.	at average price 1s. 1¼d. per bush.	52	9	6
Bran	433¾ bush.	at average price 1s. 1¼d. per bush.	23	18	11
Lucerne chaff	14¼ cwts.	at average price 4s. per cwt.	2	17	0
Meat meal	40¾ cwts.	at average price 18s. 6d. per cwt.	37	13	10
Grit (including hard grit, shell grit, charcoal, &c.).	9½ tons		1	19	8
			£239	9	6

Average cost per bird for year, 5s. 3·8d

PRIZE WINNERS.

Section I.

			£	s.	d.
1.	E. McKenzie	1,444 eggs	10	0	0
2.	Moritz Bros.	1,361 "	5	0	0
3.	Indra Poultry Farm	1,340 "	3	0	0
4.	W. G. Swift	1,337 "	2	0	0
5.	J. E. Bradley	1,335 "	1	0	0

Section II.

1.	D. Kenway	Black Orpingtons	1,222 eggs	10	0	0
2.	T. W. Cote	"	1,149 "	5	0	0
3.	J. E. Bradley	White Wyandottes	1,089 "	3	0	0
4.	Cowan Bros.	Black Orpingtons	1,079 "	2	0	0
5.	B. P. Martin	"	1,057 "	1	0	0

Section III.

1.	R. Carling	1,330 eggs	10	0	0
2.	C. Sampson	1,273 "	5	0	0
3.	" Herdsfield "	1,270 "	3	0	0
4.	J. Rowe	1,193 "	2	0	0
5.	R. Kerr	1,192 "	1	0	0

In section I. the winner, E. McKenzie, is a Victorian breeder; second and third places are occupied by South Australians, viz., Moritz Bros, Kalangadoo, and Indra Poultry Farm, Freeling; fourth and fifth prizes go to Victorian breeders. In section II. (heavy breeds), the first four prizes go to breeders in the other States, and fifth prize to B. P. Martin, Unley Park.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1913-14.

[Started April 1st, 1913, terminated March 31st, 1914.]

Competitor.	Eggs Laid for Month ended Mar. 31st.	Total Eggs Laid from April 1st, 1913, to March 31st, 1914.
SECTION I.—LIGHT BREEDS.		
White Leghorns.		
Hurford, E. W., Grangeville	80	1,194
Hammill, H., Kogarah, New South Wales	80	1,269
Carter, A. A., Keswick	26	947
Robins, G. W., Hawthorn, Victoria	40	1,219
Dunn, L. F., Keswick	54	1,214
McKenzie, H., Northcote, Victoria	44	1,258
Cowan Bros., Burwood, New South Wales	37	1,159
Robbins, G. W., Hawthorn, Victoria	70	1,132
Pettigrove, T. A., Northcote, Victoria	37	1,166
Eckermann, W. P., Eudunda	36	919
Robertson, F., New Hindmarsh	31	1,054
Pettigrove, T. A., Northcote, Victoria	59	1,085
Cant, E. V., Medindie	32	964
Schafer, N. H., Strathalbyn	73	1,195
Redfern Poultry Farm, Caulfield, Victoria	50	1,169
Chapman, G. H., Port Pirie	32	789
Lewis, F. M., Caulfield, Victoria	52	1,192
Redfern Poultry Farm, Caulfield, Victoria	85	1,329
Hagel, W. C., Mallala	77	1,248
Hocking, E. D., Kadina	72	1,071
Sargenfri Poultry Yards, East Payneham	68	1,144
Joass, W. A., Rothbury, New South Wales	33	1,172
Bennett & Furze, Wright Street, Adelaide	66	1,105
Jury, W. H., Torrensville	75	1,195
Olive Poultry Farm, Freeling	54	1,210
Kelly, Mrs. W. J. L., Quorn	35	727
Indra Poultry Farm, Freeling	65	1,340
Electricum Poultry Yards, Glenelg	44	1,039
Sargenfri Poultry Yards, East Payneham	57	1,274
Moritz Bros., Kalangadoo	64	1,361
Brown, S., Gembrook South, Victoria	69	1,144
Matthews, H. G., Fullerton	58	1,195
Harris J. G., Black Forest	63	1,157
Tockington Park Poultry Farm, Grange	42	1,136
Bradley, J. E., Newport, Victoria	83	1,335
Miller, B., Parkside	28	988
McKenzie, E., Northcote, Victoria	71	1,444
Tockington Park Poultry Farm, Grange	80	1,324
Provis, W., & Son, Tumby Bay	77	1,288
Hillcrest Poultry Farm, Brighton, Victoria	48	1,175

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended Mar. 31st.	Total Eggs Laid from April 1st, 1913, to March 31st, 1914.
SECTION I.—LIGHT BREEDS—*Continued.*		
White Leghorns—*Continued.*		
Beadnall Bros., Gawler	29	950
Morgan & Watson, Frankston, Victoria	56	1,302
Gibbs & Pine, Queenstown	29	878
Hillside Poultry Yards, Hamley Bridge	36	929
Hall, A. W., South Oakleigh, Victoria	20	1,092
Dreyer, G. H., Wolfram Street, Broken Hill	62	1,213
South Yan Yean Poultry Farm, Doreen, Victoria	21	1,189
Pope, R. W., Heidelberg, Victoria	56	1,332
Tabuteau, J. O., Black Rock, Melbourne	32	1,060
"Koonoowarra," Enfield	9	1,034
Hagger, J. C., Orroroo	72	1,307
Bertelsmeier, C. B., Clare	80	1,214
South Yan Yean Poultry Farm, Doreen, Victoria	10	1,179
Jelliff, Mrs. T., Beverley, Adelaide	53	1,283
Hughes, J. J., Elsternwick, Victoria	19	1,092
Stewart, J. R., Thirlmere, New South Wales	30	1,001
Aveling, T. B., Quorn	10	896
"Nunkerowi," Neales Flat	19	940
Prior, D., Moonta Mines	32	967
Leonard, W. J., Port Pirie	33	1,078
Barkla, L. W., Gawler South	21	1,046
Foreman, E., Hindmarsh	56	1,153
Broderick Bros., Gawler	17	881
Tubb, E. C., Frewville	46	1,027
Harfield, B. L., Pinnaroo	49	897
Foreman, E., Hindmarsh	65	1,069
Tomlinson, W., Westbourne Park	48	1,175
Woodhead, H., Torrensville	69	1,231
Padman, A. H., Hyde Park	87	1,245
Franklin, G., Norwood	76	1,175
Mathias & Weller, Unley	49	971
Messenger, A., Port Adelaide	62	1,274
Albion Poultry Farm, Magill	78	1,170
Dunstan, L. A., Port Pirie	60	1,102
Trenwith, T. H., Kadina	28	883
Purvis, W., Glanville	79	1,309
Rice, J. E., Cottonville	37	1,078
Evans, H. A., Richmond	67	1,151
Miels, C. & H., Littlehampton	82	1,237
Swift, W. G., Northcote, Victoria	89	1,337
Bertelsmeier, C. B., Clare	56	1,171
Brundrett, S., Moonee Ponds	58	1,141
Glenelg River Poultry Farm, Mount Gambier	59	1,104
Padman, A. H., Hyde Park	29	1,086
Purvis, Miss Gracie, Glanville	52	1,122
Braund, J. E. & H. J., Islington	58	1,157
Ontario Poultry Farm, Clarendon	38	853
Brock, A. G., Hamley Bridge	34	980
Russell, E. L., Salisbury	36	1,066
Schwabl, J., Elsternwick, Victoria	63	1,177
Moritz Bros, Kalangadoo	65	1,183
Craig Bros., Hackney	41	1,110
Codling, H., Mitcham Park	23	724

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month Ended March 31st.	Total Eggs Laid from April 1st, 1913, to March 31st, 1914.
SECTION I.—LIGHT BREEDS—*Continued.*		
WHITE LEGHORNS—*Continued.*		
Tidswell, H. J., Clarence Park	28	848
Bennett, E. V., Kalangadoo	52	1,094
Lillywhite, R. G., Malvern	54	1,047
Harris, A. W., Mallala	32	1,129
Hagger, W. H., Malvern	33	1,130
Winter, W. C., (Nalpa), Strathalbyn	31	698
Whitegate Poultry Farm, Deepdene, Victoria	35	1,095
BROWN LEGHORN.		
Toe, C. E., Brighton, Victoria	27	724
BLACK MINORCA.		
Whitrow, A. J., Knoxville	20	819
SECTION II.—HEAVY BREEDS.		
BLACK ORPINGTONS.		
Neville, A. B., Fullarton	62	988
Thornton, W. J., Kew, Victoria	50	944
Kenway, D., West Pennant Hills, New South Wales	71	1,222
Martin, B. P., Unley Park	54	1,057
Cowan Bros., Burwood, New South Wales	53	1,079
Tockington Park Poultry Farm, Grange	36	956
Pearson, W. S., Kingswood	4	868
Hall, A W., South Oakleigh, Victoria	24	854
Padman, J. E., Plympton	54	992
Greaves, W. E., Prospect	19	735
Bertelsmeier, C. B., Clare	16	555
Coto, T. W., Myrtle Bank, Victoria	84	1,149
Convent of the Good Shepherd, Oakleigh, Victoria	30	884
BUFF ORPINGTONS.		
Hocart, F. W., Clarence Park	41	799
SILVER WYANDOTTES.		
Dunn, L. F., Keswick	61	991
Western, F. C., Marion	72	843
Kappler Bros., Marion	44	740
WHITE WYANDOTTES.		
Bradley, J. E., Newport, Victoria	90	1,089
BLACK LANGSHANS.		
Stevens, E. F., Littlehampton	74	937
FAVEROLLES.		
Williams, W. H , Frewville	32	731
DORKINGS.		
Cathcart, J. F., Newburg, Scotland	31	704

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Eggs Laid for Month ended March 31st.	Total Eggs Laid from April 1st, 1913. to March 31st, 1914.
SECTION III—PRODUCERS.		
Limited to Entries from Farmers, Pastoralists, Fruit and Vegetable Growers.		
WHITE LEGHORNS.		
Broster, G., Mallala	27	1,024
Carling, Mrs R., Kangaroo Flat	80	1,330
Rowe, J., Long Plain	57	1,193
Broster, G., Mallala	34	1,086
Gilbert, F. W., Kangaroo Flat	18	1,135
Campbell J. D., Barabba	25	1,165
Forest Leigh Poultry Farm, Jamestown	19	915
Kerr, R., Longwood	44	1,192
Carling, Mrs. R., Kangaroo Flat	21	1,154
Rowe, J., Long Plains	34	1,122
Gill, R, Marrabel	40	941
Wurst, G. H., Marrabel	56	1,098
Sherrah, E., Long Plain	44	1,046
Rowe, N., Long Plain	70	1,125
Shepherd, R. H., Balaklava	35	1,061
Lacey, F. C., Kybybolite	52	956
Bertelsmeier, O. O., Booborowie	59	1,149
Dunn, H. J., Black Springs	43	942
Rackham, C. Naracoorte	42	1,141
Holmes, F. A., Naracoorte	29	821
Hutchison, W. J. S., Naracoorte	22	751
"Herdsfield," Mount Gambier	63	1,270
Smith, R. L., Hynam	33	851
Gill, Mrs. J., Kapunda	33	876
Sampson, C., Kooringa, Burra	57	1,273
BLACK ORPINGTONS.		
Dunn, H. J., Black Springs	46	769
BLACK LANGSHANS.		
"X.L.C.R.," Littlehampton	112	964

D. F. LAURIE, Poultry Expert.

* * *

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, March 11th, there being present Mr. G. R. Laffer, M.P. (Chairman), Professor Perkins, Col. Rowell, Messrs. C. J. Valentine, C. H. Tuckwell, J. Miller, G. Jeffrey, F. Coleman, A. M. Dawkins, and the Secretary (G. G. Nicholls).

Bulk Handling Wheat.

The Secretary reported that the Minister of Agriculture (Hon. T. Pascoe) had intimated that he did not think anything would be gained at the present juncture by holding a conference, such as had been proposed by the Council of Agriculture of Victoria, on the question of handling wheat in bulk. A further letter from Melbourne had been received, stating that in the opinion of the committee of the Farmers' and Settlers' Association of New South Wales no good purpose would be served by holding the suggested conference at present. It had, therefore, been decided to postpone the conference indefinitely, unless it should be particularly desired by Queensland or South Australian organisations. As a prompt reply was desired he therefore had transmitted the views expressed by the Minister, and the matter had been postponed indefinitely.

It was resolved to inform the Goode Branch of the Bureau that at present it was not intended to take any action in the direction of establishing wheat elevators at Decres Bay or elsewhere.

African Box.

A letter addressed to the Commissioner of Crown Lands by the District Council of Port Elliot, and sent on to the Board for an opinion, directed attention to the great appropriation of land in that district by the African boxthorn; explained that birds carried the seeds all over the country: emphasised that thousands of acres of land would be rendered utterly useless for stock grazing and other purposes unless large sums of money were expended in eradicating the pest; and urged that it should be declared a noxious weed. Professor Perkins saw no good purpose served by declaring any weed noxious, since the Act was inoperative as it stood. Mr. Coleman said that when weeds were declared to be noxious a large number of farmers endeavored to eradicate them. At the same time many of the district councils were very lax in the performance of their duties in connection with the destruction of such growths. Regarding this African box, he was not prepared to speak, but believed it was extensively used in some parts to form hedges. Mr. Dawkins—In sandy country the box spreads very rapidly and overruns good land. Mr. Birks—North of Adelaide it has not become a pest, and when it gets away it can be easily destroyed. Apparently, however, it grows much more vigorously in the south, and is a pest there. Seeing that it possesses useful qualities as a hedge-making plant, I doubt whether it would be advisable to proscribe it. Col. Rowell—In the earlier days of the State some high prices were paid for plants. Mr. Jeffrey—I think, seeing that the plant is appreciated in many localities, it would be dangerous to declare it a noxious weed, and that it will be sufficient merely to give publicity to the letter from Port Elliot, so that the landholders will be made fully alive to the objectionable possibilities of the plant. This suggestion was then adopted (see "Points for Producers,'' this issue).

VETERINARY SURGEON WANTED.

A resolution from the Lucindale Branch to the following effect was tabled :—"That the Government be requested to appoint a qualified veterinary surgeon to be stationed in this district." It was mentioned that the mover of the motion had lost two valuable horses through inability to secure the advice of a man thoroughly competent to treat them. Mr. Coleman said this was still an important question in several of the rural districts. Only recently he was asked why the scheme for the appointment of veterinary surgeons to different districts had been dropped. Stockowners were at a great disadvantage under existing conditions when any of their animals required skilled treatment. At the instance of Col. Rowell it was determined to send the communication on to the Minister of Agriculture without comment.

WHEATS AT THE SHOW.

Mr. Coleman suggested that the Director of Agriculture, who was one of the judges of the wheats exhibited at the March Show, should be asked to furnish a report for publication respecting the results of the milling and other tests. The information, he was certain, would be very interesting and helpful to the farmers. The milling was done with the new one-sack mill—imported by the department and established at Turretfield—which, according to the miller (Mr. G. H. Stevens), had acquitted itself admirably. He understood, however, that to enable milling tests to be conducted on absolutely the same lines as were followed by the commercial millers, it would be necessary to install a conditioning plant which, no doubt, would be obtained. With the aid of this the grain could be properly toughened, and the process of milling would be made easier. Without such a plant the bran was crushed up rather fine, and the flour was not so white as it would otherwise be. Mr. Coleman's idea was heartily indorsed.

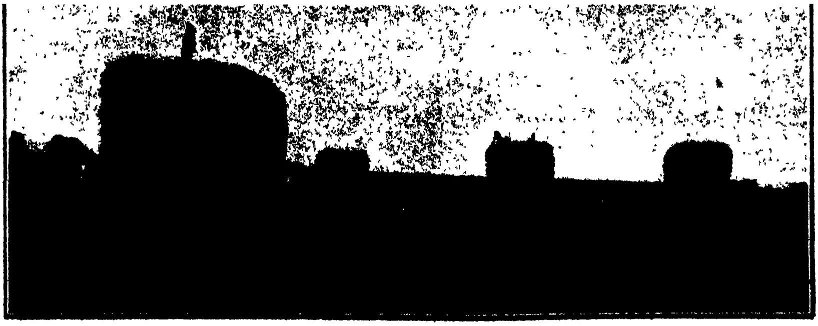
BUREAU BRANCHES AND MEMBERSHIP.

Bandon.—Owing to a local dispute in the Bandon Branch, which had prevented any effective work since the formation of same some months ago, it was decided, after careful consideration, to close the Branch.

Badge of Membership.—The Longwood Branch suggested that a badge or token of membership should be supplied to members of the Bureau. It was decided to give the Longwood Branch an opportunity to bring this matter forward for consideration at the Congress to be held in Adelaide in September next.

Life Member.—Mr. A. Goodall, a valued member of the Paskeville Branch, was duly approved as a life member of the Bureau in recognition of his services to the institution and the producing interests of the State.

New Members.—The following gentlemen were approved as members of the Branches shown, viz.:—Monarto South—A. Daly; Berri—A. V. Mills; Paskeville—M. Liddy, S. Pontifex, F. Couzner, J. C. Price, J. Petherick; Wilkawatt—J. L. Ottoway, J. Dunn, J. Oram, J. Cushion; Strathalbyn—H. L. Tucker, R. Halliday, C. L. Taylor; Two Wells—H. J. Webb; McNamara Bore—D. Bicknell; Millicent—E. J. F. Altschwager; Kanmantoo—L. Wooley, R. Shepherd, C. J. Downing; Mount Barker—L. Patrick, A. Paterson, F. Daddow, C. M. R. Dumas, A. Cornish, W. E. Pyne, S. Waters, E. G. A. Tyrie; Mundoora—H. H. Stephenson, J. R. Noble, W. Bates, E. Button; Hartley—H. Simcock, F. Pope; Wirrabara—H. S. Heathersy, J. H. Jeske; Laura—V. Walter, J. Bowman, J. Shuttleworth, A. Holland, H. McDonald, B. J. Crocker, T. P. Winter, W. H. Sellick, J. Spicer, R. F. Cox, G. G. Maywald; Spalding—W. Frost, J. J. Dowd, J. McLean, R. Dunden; Morphett Vale—R. Morrow, C. Duval, D. Whittington; Riverton—J. McInerny, J.P., W. J. George; Clare—J. Sincock; Tatiara—C. Saxon, W. A. Johnston, A. Brown; Naracoorte—P. Heffermann; Orroroo—J. Markham, F. Macdonald, W. C. Fogden, A. C. Moody; Pine Forest—W. C. Hewett; Roberts and Verran—L. E. Cowley.



Haymaking.

THE AGRICULTURAL BUREAU.

CONFERENCE OF UPPER NORTHERN BRANCHES.

The Annual Conference of Upper Northern Branches of the Agricultural Bureau was held at Orroroo on March 20th, 1914.

The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), the Director of Agriculture (Professor W. Lowrie, M.A., B.Sc.), the Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) represented the department, and Messrs. C. E. Birks and C. J. Tuckwell, and G. G. Nicholls (Secretary), the Advisory Board of Agriculture. The undermentioned Branches were represented by delegates, as follows :—Arden Vale and Wyacca—O. E. Hannemann, J. H. Williss; Carrieton—F. Kaerger; Coomooroo—W. Robertson, E. Berryman, A. H. Tilbrook, E. W. Brice, R. G. Polden; Julia—T. H. Carter; Morchard—E. J. Kitto, J. Scriven, J. W. Reichstein; Orroroo—T. H. P. Tapscott, W. C. Fogden, L. R. Cottrell, J. C. Hagger, M. W. Forrester, J. G. Shackleford, J. R. Chapman, H. Chapman, H. J. Cottrell, J. J. Dennis, J. McNaughton, A. L. Brice, E. J. Turley; Quorn—C. Patten; Tarcowie—W. S. Bennett, H. Dempster, A. W. Muller, J. Breuer, W. Travers; Wepowie—J. Chrystall, J. Crocker; Willowie—D. McCallum; Wilmington—D. S. George, A. H. Noll, P. H. Pickering, B. Jericho, J. F. A. Zimmermann. A large number of visitors also attended.

CHAIRMAN'S WELCOME.

The President of the local Branch, Mr. J. B. McDougall, in extending a hearty welcome to the Minister, the officers of the department, and visiting delegates, mentioned that on the previous day a show had been held under the auspices of the Branch. This had been successful, far in excess of expectations, and there was every reason to expect that it would become an annual feature. He asked the Minister of Agriculture to declare the Conference open.

MINISTER'S ADDRESS.

The Hon. T. Pascoe said he was very pleased to see that the farmers had not lost hope because of the bad seasons through which they had passed. In country like that represented by the various Branches included in the Upper Northern Conference district, they must expect every now and then to be faced with conditions similar to those that had obtained during the past few years. He only hoped that the coming season would turn out better, as many people seemed to think it would. Men who were, perhaps, worse off than those in this district were farmers who had gone into country that had been boomed, and had given £12 per acre for £3 and £4 land. They entered into it with a millstone of mortgage and debt round their necks. These men paid in interest much more than the farmers in some parts of the North paid in rent.

THE TURN OF THE TIDE.

South Australian farmers were in a much better position to take advantage of the good seasons when they came than they were when the tide turned in the 90's. They had made mistakes in the past, and they had suffered for them, but all their experiences could be turned to advantage when the good seasons came. One lesson which they did not appear to have learned thoroughly yet was that of making preparation in the fat years for the lean ones. If they made £1,000 in a good year, they should put aside a certain amount to carry them over the bad years. When they had a growth equal to two tons of hay per acre, they should cut more than would meet their season's requirements. A heap of cocky chaff was an excellent standby. By the addition of something of a more concentrated nature, they could make this carry their stock through dry times.

He sympathised with them, as a farmer who had gone through, and was going through the mill at the present time, and hoped that they would have a successful and profitable Conference.

SILAGE.

Mr. P. Pickering, of the Wilmington Branch, read a paper, as follows :—

"The term ensilage generally applies to a special process of preserving green fodder. Unfortunately it is little known in South Australia, but no doubt in time it will be looked upon as essential as a stack of hay. When green stuff is heaped together, either in a pit or in a stack, the most apparent change is a rise in temperature. The rise in temperature is due to the fact that cells of the plants thrown together are alive, and as such continue to breathe for awhile. As breathing is a form of combustion, it simply means a rise in temperature. When a great number of these cells are thrown together the whole mass rises in temperature until all the cells are killed by excessive heat, as no living cell can stand a temperature much above 150° F. Before the cells are killed chemical changes take place in the composition of the green forage. If these are allowed to go on unchecked acids are formed, and finally the whole mass becomes putrified. Therefore the art of making good silage consists in knowing how to use these chemical changes to the best advantage and how to check decay. The object is to exclude the air, and so prevent oxidation, which brings about fermentation, decay, and loss. The more thoroughly the air is excluded the greater the success. According to the stage of decomposition to which the silage has reached it is known as either 'sour' or 'sweet.' This depends mainly on the temperature at which fermentation takes place. Sweet silage is that in which the chemical changes have been checked more or less and the temperature allowed to go above 120° F., while in sour silage the changes have been allowed to go farther and the temperature kept below 120° F. There is no question that sweet silage has greater feeding value than sour, because the farther those chemical changes go the greater the waste of substance. To completely check the formation of acids on a large scale is practically impossible. The best method of making is to keep whatever is to be ensiled in shallow layers and allow it to heat. New layers should be put on until the average temperature is between 135° and 140° F. That temperature is sufficient to check the formation of acids. If the temperature rises much higher the silage assumes a dark, burnt appearance, and is not relished much by stock. As soon as weight is added to heated herbage a further rise in temperature is checked. If a pit or stack is filled without reference to the thermometer the silage will most likely be sour, because the temperature will not rise sufficiently to check the formation of acids.

"Maize stands out above all other greenstuff for making silage, because of its fleshy leaves and stems, which are neither too succulent nor too dry. Both are rich in sugar. Besides maize, sorghums, millets, peas, beans, and cereals can be used; in fact almost any green herbage is suitable. Because a plant will ensile well, however, it does not follow that it will always pay to use it in that way. One has always to study one's own requirements and conditions. Some people want ensilage for the winter, while others require it for the summer and autumn. There will be no advantage to ensile anything that can be used in the green state. We generally make silage from growths in spring that are in excess of what can then be used, and which can be profitably ensiled. Parts of the crops may be too dirty for grain or hay, and these can be profitably used. If we sow an area especially for ensilage it is as well to mix with a cereal (wheat or oats) peas, beans, or vetches, and always sow thickly. The best and most reliable method of dealing with it is to chaff it into 3in. or 4in. lengths. It then packs better, leaves less waste of space, and more effectively excludes the air when the weight is put on. One disadvantage in chaffing is the difficulty in handling, unless one is using the overhead silo. One condition that must be observed is that more stuff should not be cut than can be used immediately. It is a mistake to cut a great amount and let it lie about, because when the stuff wilts it is difficult to secure the necessary rise in temperature. Not more than three days should elapse before adding more material, as the top will go mouldy. Salt sprinkled on occasionally is an advantage. As the pit is being filled great care should be taken to tramp down the mass firmly, especially around the edges, because in settling down it has a tendency to leave the walls and settle in the middle. The pit should be filled a few feet above the top and allowed to settle; filled again, and allowed to settle, and so on. There will then be very little waste space on the top of the pit. Finally, it must be weighted down. On top of the greenstuff place 6in. or so of chaff or straw to exclude the air, cover with boards, and distribute weights evenly over the surface at the rate of 1cwt. per square foot. The pit is then finished, and if made properly it will remain good for years. With 'stack' ensilage, the main advantage is that it does away with the expense of a pit or overhead silo. The chief objection to this is the loss around the edges, which may extend from 12in. to 18in. inwards around the stack. If it is intended to make only a small quantity the stack is not to be recommended, on account of the greater loss compared with the pit. The stack is built like a haystack, with vertical sides. When the stack is finished the edges should be higher than the middle. When the required height is reached it should be weighted. Considerably more weight should be used than in the pit, from 2½cwts. to 3cwts. per square foot being required. The overhead silo has an advantage over both of the methods described, in that when it is filled it can be emptied by means of gravitation. Chaffed forage can be used to advantage in this form, as it can be elevated into the silo.

Comparison with Hay.

" In comparison with hay, silage always represents a bigger weight, going from 50lbs. to 60lbs. per cubic foot. Roughly speaking, five tons of green forage will make one ton of hay, whereas it will make four tons of ensilage. Is does not follow, however, that the ensilage is four times more valuable than the hay. The main difference lies in the amount of water retained. Silage will hold about 70 per cent. of its own weight of water, while hay will not hold more than 10 per cent. to 15 per cent. Ensilage constitutes a foodstuff far more digestible than hay. About three tons of ensilage equal one ton hay made from the same forage. Ensilage is fed almost exclusively to dairy herds; in fact, it is rarely used for any other purpose. In a country like this, where green succulent food is not obtainable for months in the year, it could be fed with advantage to any stock. Probably in the course of time, when it becomes known that stock can be profitably fed with ensilage, it will receive more attention."

Discussion.

Mr. C. J. Kitto (Morchard) said the writer had advised putting in a layer of silage every three days; he would like to know whether it was necessary to weight the stack after each layer was put on.

Mr. Pickering replied that the weighting was only necessary when the stack was completed.

Mr. J. W. Lock (Carrieton) said it had been stated that ensilage had a deleterious effect on the milk when fed to dairy cows. Was that so ?

Mr. Pickering said that would not happen if small quantities were fed to the animals at first.

Mr. R. Phillis (Wepowie) asked whether wild mustard would be suitable for ensilage.

Mr. Pickering said that if it were put in with other stuff it would not affect the silage.

The Chairman asked whether it would be safe to use sweet ensilage for feeding young horses.

Mr. Place (Government Veterinary Lecturer) said from experience he could say that silage, whether sweet or sour, fed under commonsense conditions, was practically safe for any class of stock. He had fed horses on practically nothing else for months. However, stock of all classes could not be constantly changed from one class of feed to another without upsetting their digestive arrangements. If they were going in for ensilage, they should begin to feed it before they got their stock off the other feed, gradually accustoming them to it. They could not get away from the fact, however, that with silage in the stack or in the silo, they allowed in a great deal of air, with the result that a number of moulds grew, and these upset the animals. If this stuff were fed with cocky chaff, or some such dry material, it would be safe. Practically any greenstuff could be made into ensilage. Whilst it was best to chaff the material being ensiled, this meant a certain amount of labor and expense. They could construct very cheap silos if they had a hillside on the farm. These could be filled from the top and emptied from the bottom, which would save a considerable amount of labor. In India they constructed silos of bamboos and mud—a capacity of about 100 tons being built for from £15 to £20. If they fed the silage to cows after milking there would be no trouble on account of the milk being tainted. They could safely feed a horse on up to 40lbs. of silage per day, but 10lbs. was enough to begin with; 60lbs. per day would not be too much for a cow, 15lbs. being sufficient at the beginning.

Mr. T. H. P. Tapscott (Orroroo) asked whether wild oats cut for silage should be allowed to stand in the paddock.

Mr. Pickering said it should be stacked immediately.

The Director of Agriculture said silage was a means of storing feed and still retaining a percentage of its succulence. In this respect it was of value. However, in country where they could grow a small area of lucerne, for example, to keep the stock from stomachic troubles, personally, he would not make the feed into silage, but would give a small percentage of greenstuff with the ration. A great deal of labor was entailed both in putting in and taking out the silage. He strongly opposed underground silos. As a matter of thriftiness in making a definite weight of food go further—and this was the critical test—he was of the opinion that they got more out of it by making it into hay than by making it into silage. When feeding silage they should not give it to cows near the place where they were milking; they would then find that it would improve the quality of the produce rather than deteriorate it. Instead of putting money into the construction of a silo, he preferred to spend it in the purchase of a windmill and distributing pipes. Silage was certainly particularly suitable for cows; the same advantage did not obtain with sheep, and with horses his experience generally was that they did not take to it very well, although some horses ate it ravenously. The method of making recommended by Mr. Pickering was sound.

Mr. C. E. Birks (Advisory Board) had found it a decided advantage to chaff fodder intended for ensilage. Long stuff entailed considerably more trampling, and there was more likelihood of it turning out mouldy. Taking into consideration the extra trampling and spreading, it took just as long to get it into the silo as when it was chaffed. In New South Wales, he had noticed, they scooped out a channel about 6ft. or 8ft. deep, carried the fodder into this, and covered it with earth. At Junee they were now using fodder that had been held for three years in this way.

SORGHUM FOR HAY.

Mr. C. E. Birks tabled samples of sorghum cured for hay and chaffed. It had been grown at Wandearah. He contributed the following notes:—"There is no doubt that sorghum would be more largely grown in suitable places, such as river flats and lowlying land, and as a chance crop on ordinary wheat-growing land if it were generally recognised that the crop could be profitably cut, stooked, and cured. That such is the case is proved beyond doubt by actual experience. What the feeding value of the chaff actually is can only be determined by use and analysis. The sample exhibited is from a crop of three acres grown under irrigation, which consisted of one flooding just after the crop was sown. It grew to a height of 6ft. and not receiving another watering, seeded profusely, and at the same time was remarkably green down to the bottom of the stalks. At this stage the binder was put into it. It was cut and stooked and left for four to five weeks before carting. This curing, or drying, is the one weak point, as in the case of irrigable land it is important to get the crop off quickly; and it would necessitate the crop being watered two weeks before cutting, and then before the hay was fit to cart the second crop would be anything from 2ft. to 5ft. high again. The rows being 20in. to 24in. apart, the stooks would need to be made in the spaces and as flat as possible, to lessen the time of drying. On non-irrigated land this trouble would be much less, if it existed at all; the carting might have to be done through a growth of 2ft. of sorghum, but as this would in all probability be fed off, no harm would be done unless the stooks were put on top of the rows. In cutting the crop it is as well not to take a full cut at a time, as two rows give the machine plenty to do. It would then be covering 3ft. 4in. to 4ft. It is as well, if the land is fairly dry on top, to let the sheaves lie for a few days before stooking, and when this is done, with three weeks' good hot weather, it is possible that the crop will be fit to cart. Sorghum seed is one of the most fattening grains I know of, and by this method it is possible to make use of it. There is a large amount of loss when fed long, unless the crop is cut before the seed is ripening. To chaff it economically it must be made into hay, except in establishments where it pays to chaff the greenstuff every day; and that, of course, is a matter of quantity. I fully believe maize could be handled in the same way, only the curing trouble would be the greater. It sometimes happens that a farmer has a far greater amount of greenstuff than he can deal with. For instance, he sows 20 acres of sorghum in the hope of getting some greenstuff on which to turn his stock. If conditions are very favorable the result is a quick growth of, say, 5ft., 6ft., or 7ft. To turn stock into that is not only waste, but it causes a deal of trouble in the way of clearing up land for the succeeding crop. If as much as it is possible to use is cut out, and the balance treated for hay, the next growth can be fed off clean. The latter should not be allowed to grow too much stalk. This plan will work admirably on land adjoining rivers or dams that go dry, for one good soaking on the crop after it is in (and up for preference) will ensure one good cut and fair growth after."

In reply to questions, Mr. Birks said he sowed about 5lbs. or 6lbs. per acre in November, using every third hoe of the drill only. It was cut with the binder. In the particular case under notice the variety used was Early Orange Cane. No manure was used, as the seed was put in on a rich river flat.

The Director of Agriculture mentioned that Early Orange Cane and Early Amber Cane varieties had been proved in this and other countries to be the best.

AFTERNOON SESSION.

ENCOURAGEMENT OF MILLING.

Mr. W. Robertson, of the Coomooroo Branch, read a paper, as follows :—"The marketing and bulk handling of wheat is a subject which is receiving a good deal of attention at the present time, with the object of economising expense and securing to the grower a better return for his labor and outlay. There is one way in which this could be done which has not received as much attention as it might. If our milling trade could be encouraged, and a trade in flour established with the United Kingdom, it would reduce both freight and handling charges by one-third, and be a gain, not only to the farmer, but to the manufacturer and the laborer as well. Mill offal, for which there is a growing demand, would be retained in the country and used for dairying and stock fattening. The trouble in the past has been that the South Australian millers have been unable to compete with the British millers on account of the extra cost of labor. This difficulty might be overcome either by a little help from the Commonwealth, or by some other means, until a trade is established. The British miller buys our wheat chiefly for blending purposes, ours being the superior article. Surely our millers, with all good wheat, can produce a grade of flour that will compete successfully with that made in Great Britain, where they use part good wheat and part inferior."

Mr. J. Scriven (Morchard) said there was difficulty in getting offal from the mills at the present time at a satisfactory price. Possibly the scheme recommended by Mr. Robertson, if adopted, would result in an improvement in this regard.

The Hon. T. Pascoe said it was a difficult matter for the South Australian farmers to comply with the requirements of the British bakers with regard to flour. They not only wanted a flour of even quality, but they even went so far as to want flour made from particular varieties of wheat. So far as South Australian methods of marketing were concerned, this was impracticable. It became a question as to whether they would give the grower better prices when he was marketing his produce as flour than they would give for the wheat. Australian wheats had a special value for blending, because of the dryness of the climate in which they were produced. This put a special price on them over and above that which they would otherwise secure. Some tests made in connection with the Leeds grocers' exhibition last year had proved conclusively that bread made from South Australian flour was equal to bread made from any other flour, but the bakers were not prepared to use it unless there was a regular supply, both of quality and quantity, always available.

THE EASTERN MARKET.

He had been trying during the past two years to arrange with the shipping companies to call here in connection with the Eastern trade. There was a market in the East of which South Australia should be taking a greater share. The demand for offal in this State was greater than it had been before, and it would be used still more largely if supplies were available at more reasonable prices.

The Director of Agriculture said this question had agitated people in South Australia a great deal. The thought as to whether it was practicable that they should grind wheat here and send flour abroad had been encouraged by the practice obtaining in America. There was a time, not so very many years ago, when America's production was sent as wheat, and it was ground in the Old Country. Within the past 12 or 15 years a great change had taken place, and the English milling firms were feeling the competition of the Americans very keenly. Our wheat had a special value to the British miller for blending purposes. It was necessary to understand that a line of flour turned out by a mill should be absolutely regular in quality. Millers in this State had not the opportunity of doing this, because they did not blend to the same extent that the British millers did. South Australia produced a considerable proportion of soft white wheats, but farmers were gradually going in for varieties yielding stronger flour. A stronger wheat would produce more loaves of bread to the bag than a weaker grain. The position was that neither the grower nor the miller nor the baker had the chance of learning enough about the question. However much they might desire to get a footing for their flour in the English market, until they got the constancy referred to above, they would not be successful. What they should strive for was a share of the trade in the East and in South Africa. Australia should have the advantage in these markets, because our flours, when conditioned, kept better than those of England.

Mr. Kelly (Orroroo), who had been a miller for a number of years, said this State could not compete with England and America in the grinding of wheat, not on the score of quality, but on account of the cost.

WATER FOR LIVESTOCK.

The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), in an address under the title "Water in the Diet of Livestock," said—"At a meeting of farmers there seems to be a fixed idea that a veterinary surgeon should talk disease and all the drugs of Araby. The Chinese are wiser; they pay their doctors, and no doubt their veterinary surgeons, too, as long as the patients under their charge remain healthy, and the subsidy stops when disease appears. The speaker is not prepared to say whether this method would meet with the approval of the veterinarians in this State or not, but in practise it is what the Stock and Brands Department carries out, namely, the control and stamping out of disease; and it appears to the speaker that the prevention of preventible troubles is a matter for farmers to closely consider for themselves; hence, he has chosen for a short talk to-day the importance and the value of water in the everyday diet of the animals of the farm. And in addressing a meeting at Orroroo, the importance of this item of diet will very forcibly impress itself upon his hearers. If the question is raised as to what is to be done if there is no water, then he would say there should be no stock. The striking of the rock by the diamond drill of the borer may produce the miraculous gushing forth of the water so anxiously desired by a thirsty land; but if waterholes without water, dams dry, and creeks crusted with salt are to be offered to thirsty stock, then, surely, the brains of the South Australian farmer must be utilised on the question of dry farming in relation to the vegetable kingdom rather than the animal; because common sense must plead for the necessity of an adequate water supply if animals are to be expected to live, let alone thrive. Paralysis, dry bible, and similar affections are, in a great number of cases, simply fancy names for shortness of water, which fluid forms more than half the body weight of an animal; and yet is often ignored altogether when the matter of building up that body is being discussed. It is the chief medium by which the nourishment of the food is carried into the blood, and the main cleanser of the bowels, and preventer of those forms of stoppage which account for so many deaths among stock in South Australia. Water is of the highest importance in all the processes of change in the animal body which are spoken of as life, and it is especially so in the processes connected with digestion. It helps in chewing; by it the food is rendered fit to be absorbed by the bowels; it is the chief carrier of nutriment to the system, for without a sufficiency the blood is unable to utilise the food offered to it; its evaporation by the skin and lungs is one of the chief means of keeping the body at a suitable temperature; and its presence is absolutely necessary in what is called the metabolism of the food, those intricate changes which transform the vegetable cells into fit food for animal tissues by such marvellous processes that even the balance of the chemist is not able to check the minute alterations that take place. When water is not present in sufficient quantity the processes of digestion are slowed down and those of waste removal checked, so that poisons form in the system which would not otherwise do so, and the products of protein digestion rapidly change into virulent poisons. When the blood is too thick from loss of water the body temperature rises and the system becomes more liable to attack by those poisons, and the young, both before and after birth, are seriously crippled in their struggle for existence, while thirst diminishes the desire for food, and purging, vomiting, paralysis ensue, and death does not loiter on his way. The calf, with tissues of some 65 per cent. moisture, lives upon suction only, while the fat Merino, with less than 35 per cent., does very well upon the stubble paddock; the horse and cow standing midway must have ready access to water as well as feed. Much as the speaker dislikes quoting figures, the following are so striking that he cannot forbear reproducing them:—For every pound of dry food the pig requires 7lbs. to 8lbs. of water, the cow 4lbs. to 6lbs., and the horse 2lbs. to 3lbs. just as a maintenance ration. That is to keep life in the body, without considering such matters as the reproduction of the species, the making of milk for man's use, or the labor and sweat of the team. Now, do they get it? If not, is the shortage responsible for that lack of bloom, that want of roundness and plumpness, that gaunt stretching of skin over prominent bones, which so soon becomes a hide? If experience of thousands of dead and dying beasts in the famine-stricken desert of India counts for aught, the answer would come back unhesitatingly—your cattle die for want of water, your store stock starve for want of water, your show stock is gaunt and light for want of water. The rounded rump is 50 per cent. water, the well-ribbed barrel is 50 per cent. water, the sleek smooth skin is padded out with 50 per cent. water. You pay a shilling a pound for it when you buy juicy English steak, and your canner adds it to the solid meat he has bought from the Australian grazier; he would pay you 2d. or 3d. a pound for it and be glad to do it, because frozen in the tissues of the carcass it would fetch him more on the quality of his export. Water adds weight, and nothing has struck the speaker so forcibly when on meat inspection duty as the low—very low—water content of the meat. Not only does water make weight, but it actually favors the deposit of fat in the tissues; which means all the difference between a poor carcass and prime one. Now, do not think that — like the farmer who found the wheelwright put putty in his wagon to strengthen it, ordered the next to be built all of putty because he wanted that to be extra strong—our beasts should be wrapped in oilskins to conserve the moisture, for even with water, enough is as good as a feast, and excess leads to indigestion, waste of food material, and flabby muscles; but it seems like painting the lily and gilding refined gold to talk about an over supply of water here. However, what is pertinent to the district and conditions is this fact: The water contained in the food is of far greater feeding value to the animal than that taken as drink, and it is of great interest to read the tables so carefully worked by Professor Perkins and his staff, and to note that the water content has a marked influence on the feed value of hay. Australia is deeply indebted to Professor Perkins for the care and accuracy bestowed on those unique observations, as well as for his advocacy of succulent fodders like berseem. It is a fact worth noting that in the country once called the Ninety-Mile Desert, men now put down their 1,000 acres of lucerne with every confidence, and are rewarded with the success they deserve; they are feeding water, and they find it pays. Professor Lowrie insists, in season and out of season, on the preservation of the humus of the soil, and not only so, but tells you it must be got into the soil that has it not; he tells you it is the greatest moisture-conserving agent you can get, and he goes further and tells you how the green crop, be it rape or vetches, lucerne or mixed clovers, will help you to ward off those seasons of drought which hang so ominously over our heads. In one word, he is asking you to feed water. Doubtless many of you know how the beast has been dragged from death's door by copious drenches of pollard gruel, or some other mixture of which water has formed the greater part, and you will not be surprised to hear that life has often been saved by injecting warm water into an animal's veins. Our cereals contain about 12 per cent. water, our green fodders vary from 40 per cent. to 70 per cent., while our bleached straw has been treated by nature much as the chemist would do if he wanted to find out its constituents, without water; it has been kept for hours at a high temperature, and consequently contains very little indeed. If we watch our animals at ease in the paddock when out of work, we shall find that they do not drink often, once or twice a day under ordinary circumstances; but if we could check the observation we should find that they would drink from two to four times the weight of water more than the forage they eat, figures which closely approximate those quoted above if allowance is made for water in the fodder. It may be taken that an idle horse in ordinary weather will take about 7galls. a day, but heat, work, and similar conditions will largely increase the quantity;

for instance, a light horse kept trotting was satisfied with 3galls., but immediately doubled his requirements when trotting with a load. When the horse is at rest and drinking 6galls., he will pass 3galls. in his dung, 1½galls. in his urine, and 1½galls. by his lungs and skin. Work will immediately alter this ratio, and this explains why the attack of stoppage of the water follows a hard day's work. Heat will make the lungs and skin do more than their share, and so explain why congestion of the lungs is likely to follow a very hot day's work. We notice that horses in the army or used by large coaching or carrying firms are generally plumper and in better condition than many on the farm, and we think how nice it is to have a nation's purse or a company's profits with which to feed horses. Armies and carrying firms do not keep horses for the fun of the thing, but they find that it pays to feed water. It runs through the pipes and costs nothing for delivery, and the collar does not gall or the saddle wring the horse that has as much as he wants. Sometimes we are shocked when we see such horses white with sweat going to the trough and drinking at their will. We are even more shocked when we see the hose playing over them. The army has to keep fit, the company has to pay dividends, dead or ill horses will not help in either case, so they get good food little and often, and drink as just described; because physiology shows that a horse should drink before he gets his food, which will take some hours to digest, and so long as he is not kept standing in a keen, cutting wind after, he makes better use of his food and water when he gets the latter first. Cattle, on the other hand, have an arrangement which enables them to make better use of water if they take it on the top of a certain amount of roughage, which will have to be re-chewed as cud. With the working horse, evaporation of water is so rapid that the functions of the various organs of the body are seriously interfered with if they have to draw entirely on the water contained in the caecum or water gut, and, therefore, they will do much better if they have the chance of drinking at reasonable intervals during their work. We carry the water bag with us, but have an unreasoning fear of letting our horse do what we find necessary. He has as much sense as we have, and he will not drink too much if he can get it now and again; but, like ourselves, thirst will drive him to do stupid things, and his digestion will suffer in consequence. The wearied horse should not have too much, any more than a wearied man; but the latter is all the better for a glass of beer or a cup of tea, and so will be the horse for half a bucket of water with a handful of oatmeal or pollard stirred up in it, or a few mouthfuls of lucerne or wetted hay followed by a moderate drink. Food and drink, little and often, for the working horse will keep him fit and free from sores or ailments. Succulent food will supply half the drink a cow needs, and nearly all a sheep wants, while the pig will thrive much faster if he has a liberal supply of wash than he would on dry stuff only; and with them all that is the end and aim of their existence, to give the best return in the shortest time for the least cost."

In reply to questions, Mr. Place said it was a mistake to have the water trough alongside the manger, where the animal would foul the water with chaff, but they should have the trough in the yard, available to the horses at all times. If time and labor were available to malt wheat and warm up mashes, cows would do well fed on these, but they would thrive better on dry feed than on food partially wet at times. No harm would be done if they turned horses in a heated condition into a yard with a trough, so long as they were not exposed to a bleak wind. If the animals were very thirsty, however, they would do better by placing a couple of handfuls of bran or pollard into a bucket of water, and restricting each beast to this for a while before it went to the trough. Generally, water from artesian bores was suitable for stock, but when salt of magnesia were present this was not so. Well water was better; it was generally cleaner than water from dams, in which blood worms found an excellent breeding-ground.

PRESERVATIVES IN CREAM.

Mr. C. J. Tuckwell (Advisory Board), after apologising for the absence of Mr. G. R. Laffer, M.P. (chairman) and Mr. F. Coleman (vice-chairman), advised dairymen not to use preservatives in their cream. If anything were used, however, it should be either small quantities of salt or boracic acid compounds.

FRUIT AND FOWLS.

Mr. J. C. Hagger, of the Orroroo Branch, read a paper entitled "Poultry in the Orchard." He said—"Domestic fowls can be reared in the orchard and gardens with very little damage to the fruit and trees. They do far more good than harm by destroying pests and enriching the soil. In laying out orchard and runs and erecting houses great care should be taken to have each row of trees of the one kind. This will save labor in picking the fruit and also in spraying. For example, take it that we have an acre to lay out in trees and poultry runs: I should make the runs 20ft. wide and plant all the trees on the north side of each run. A 3ft. wide gate should open inside of each on the south side. This will allow 17ft. for the spread of the trees, which should be planted in the centre of the 17ft. and about 12ft. apart in the rows. Most of the shade will then be on the north. No vines should be planted in any of the runs that will be used in the summer months, for the grapes are apt to give the birds diarrhœa. The roosting houses should be made of four 4in. x 2in. or 3in. x 2in. posts, each 4ft. in height; 6in. x 1in. jarrah for bottom boards and 6in. x ⅞in. flooring for top boards, and framed in order to fit 9ft. x 3ft. plain iron for the back and 6ft. x 3ft. plain iron for the sides. Three sheets of 10ft. iron are required for the roof. Use sawn 2in. x 1½in. jarrah or deal for perches. The front can be left open to the north. This class of house will accommodate 40 fowls, is easily and cheaply constructed, provides no cracks or harbors for tick, and is easily shaded by placing it close up to the centre tree in the run. By having apples in one run, early peaches in another, and so on, the fruit will be ready to pick at one time, and the fowls can easily be shifted for a few weeks to one of the other runs at this period. Early peaches and apricots, and late apples and pears are most profitable. Chicks of all ages and fowls should not be allowed to run together. It is better to bring all the chickens out in the one batch, but in these parts the incubator is not in general use. I recommend the incubator for the sake of getting the early chicks. It will well repay the cost. By growing vegetables in some of the runs the ground receives more working, and when one crop is getting done one can fork up the ground and put on the chicks. They will get more worms, &c., and more exercise. Keep a sharp lookout for poultry ticks; eradicate them as soon as they are noticed. Gather the eggs daily. The infertile egg is the commercial egg of the future. There is a loss to this State of £60,000 annually on bad and rotten eggs through neglect. Whatever profit there is in fowls running at large there is double the profit if they are housed properly and kept under control. More labor is involved to start with, certainly, but far less afterwards. Separate the cockerels from the pullets as early as possible. Have the cockerel pens all at one end and out of sight of the pullets, and both will thrive better. Keep the drinking water in the shade. Get all surplus cockerels to the market as soon as possible. Get rid of all hens after two years old. Do not overfeed or underfeed. Give plenty of cut lucerne in the mash, and not too much mash to the breeding pens. Keep breeding stock, if good, for four or five years."

In reply to an inquiry from Mr. Tapscott, Mr. Hagger said the best fowl to keep was not so much a question of breed, but of strain. Of the light breeds, however, he recommended the White Leghorn. This would "rough it" better than any other in the north. Fowls did better in confinement than running free. A run 15ft. by 50ft. would provide ample accommodation for 40 hens. An effective method of dealing with tick was to wash the houses and runs with a mixture of 10galls. of boiling soapsuds and a bottle of kerosine. Grease, oil, and insectibane could be applied to the birds.

BLIGHT IN CABBAGES.

In dealing with this subject in a paper, Mr. J. Crocker (Wepowie) said blight attacked the cabbage plant at any stage of its growth. Turnips were also affected. He had tried dressings of lime, ashes, and sulphur, with the idea of checking the pest, but with little effect. Placing the crop on new land also was ineffective. The practice he was now successfully adopting was to dig in a light application of super. when the cabbages were being planted, and also to sprinkle the plants with super.

The Chairman mentioned that this year was the worst he had experienced with blight. Crops of cabbages and turnips were completely cleared out in the course of a few days.

EVENING SESSION.

NEXT CONFERENCE.

It was decided that the annual gathering should be held at Quorn in 1915.

IRRIGATION ON THE FARM.

Mr. F. Kaerger, of the Carrieton Branch, in a short paper, said—"There are very few farms that are without a well and windmill, or permanent water. All water fit for stock will grow lucerne and some varieties of vegetables. The farmer who possesses a well and windmill should have at least one acre under lucerne. If put in well and attended to properly this will provide enough greenfeed through the summer for six cows and several horses. Where pipes are laid summer vegetables do not require a great deal of attention. If the seeds of some varieties like cucumber and beans are put in in small quantities every 10 or 14 days this will ensure a succession of crops. Tomatoes, sweet or rock melons, water and pie melons can all be grown without much trouble. They require only two thorough waterings per week in very hot days. If a small plot of cabbages, carrots, &c., is put in beside the summer vegetables this will grow well. The cost of the pipes, hose, sprinkler, &c., would be amply repaid."

MANURES.

The Director of Agriculture (Professor Wm. Lowrie, M.A., B.Sc.) delivered an address. He dealt at length with the policy adopted by a number of farmers of purchasing low-grade super. Without imputing even a suggestion of unfair practice on the part of the distributors, he stated that apparently many tillers of the soil were buying superphosphate at a price considerably above that which they need pay for it. Some of the merchants, he added, were charging £3 17s. 6d. a ton for super. containing 30 per cent. of phosphate of lime, and £4 5s. a ton for that known as 36 per cent. quality. Artificial manures were generally valued on the price per unit—1 per cent. of phosphate of lime rendered soluble. The cost of the 36 per cent. on this basis worked out at 2s. 4⅓d. per unit, and that of the 30 per cent. at 2s. 7d. per unit. Those figures, which represented a difference of 2⅔d. per unit, were obtained by dividing the £4 5s. by 36 and the £3 17s. 6d. by 30. That difference did not seem very much, but it amounted to something considerable on, say, 15 tons, the average quantity of super. used by the farmers. It was not surprising to hear agriculturists who used the cheaper grade say that they obtained equally as good returns with it as they had secured by using the 36 per cent., because there might not be much difference apparent in the crop. If, however, the respective grades were used on two accurately measured plots, and the produce therefrom carefully weighed, an appreciable difference would soon be noticeable. Assuming, though, that there was actually no difference between the 36 per cent. and the 30 per cent., there could be no difference between the 30 per cent. and the 24 per cent., or between the 24 per cent. and 18 per cent. Still another 6 per cent. could be deducted, and so on, until they arrived at the point when there would be no phosphoric acid in the mixture. In reality, of course, there was a difference—a difference in the yield obtained, in the fertility of the soil, and in the cash balance in one's pocket, comparing the higher with the lower grade.

He regretted that farmers could be so short-sighted as to pay freight on 6 per cent. of stuff that was absolutely of no use to them, and pay more for the balance which was of value, because they did not trouble to reckon up the intrinsic worth of the fertiliser they were buying. The merchants knew very well the true value of the lower-grade article, but were out to do business. Recently he learned that some of the merchants were importing super. containing 45 per cent., and even as high as 48 per cent. He promptly communicated by telephone with one firm, and inquired what price was being quoted for 46 per cent. super. The reply was, "We cannot quote it, as it has all been broken down." He then asked, "Why has it been broken down?" and was told, "Because the farmers won't buy it. They want cheaper stuff." In a nutshell, that firm undertook the expensive process of mixing and thus lowering the grade for the simple reason that the farmers declined to purchase it at the figure required for the higher grade. A little calculation would show them that those who bought the £4 5s. super. received, on the basis of the £3 17s. 6d. stuff, value to the extent of £4 13s.

POUNDS, SHILLINGS, AND PENCE.

The essential and valuable element in the superphosphate, of course, was the phosphoric acid. In the 36 per cent. article there was 16·47 per cent. of this, but in the 30 per cent. there was only 13·4 per cent. The total disparity in 15 tons of the two grades was more than 900lbs. In other words, for land to receive the same quantity of soluble phosphate of lime as would be contained in 15 tons of the 36 per cent. super. it would be necessary to apply 18 tons of the cheaper material. In pounds, shillings, and pence it meant that whereas 15 tons of 36 per cent. super. at £4 5s. a ton would cost only £63 15s., they would have to pay £69 15s. for 18 tons of the £3 17s. 6d. a ton stuff to get the same amount of soluble phosphate of lime. The man who purchased the latter was therefore throwing away £6 for nothing. Not only was he doing that, he was also paying freight on 3 tons of useless sand. Here was provided a striking illustration of the value of a little technical education to the farmer. If they bought 46 per cent. super. on the basis of 2s. 4½d. per unit, it would be worth £5 8s. 7d. a ton, but purchased on the same unit value as the 30 per cent. its market value would be £5 18s. 10d. a ton. If only that 46 per cent. could be regularly obtained what a big saving the farmers would make in freight, even in a single year. If desirable on account of its stickiness, the farmer could break it down himself. The merchants would prefer to place this high-grade super. on the market, but owing to the penny-wise-and-pound-foolish policy of a large number of the farmers they could not do so.

MANURE FOR THE NORTH.

Regarding the most suitable manure for their requirements he was of the opinion, and believed that their experiences would support him, that it was the soluble phosphate of lime, and that only, that was wanted to reinforce the soils in those drier areas. There was no need for additional potash, and the same remark applied to nitrogenous fertilisers. They had there soils that had almost all their latent fertility in them. Superphosphate was more soluble and better for them than bonedust, guano, basic slag, or any of the other less soluble forms of phosphate. They favored applications of from 45lbs. to 60lbs. to the acre, but he considered that three-quarters of a hundredweight was little enough to apply. A crop of 20bush. to the acre would take out of the soil 9lbs. to 10lbs. of phosphoric acid. In 100lbs. of 36 per cent. super. they would apply about 17lbs. of phosphoric acid, so that when only 56lbs. was used as a dressing they put back into the land only that quantity which they took out. If it was merely a matter of the maintenance of the fertility the need for substantial applications would be patent, but there were other questions even more important. Plenty of phosphate immediately available induced the plants to throw out a large and more vigorous bunch of roots, and enabled them to penetrate well into the subsoil, so that when the hot weather set in the plants were better able to withstand the heat. That deeper and more vigorous rooting, however, could not be secured unless a little more than half a hundredweight of manure were used. Another point to remember was that when there was a good supply of food on hand less water was needed to meet the requirements of the plant. That was a big gain, and a most important consideration in a dry district. The heavier dressing was also beneficial from the feed-production point of view, and that fact suggested the observation that some of them thought that because they were operating in uncertain country any sort of stock would do for them. They were wrong in that assumption. They should have on their farms the best stock within their means, and then take steps to ensure them being well supplied with enough good food.

LARGE HOLDINGS DESIRABLE.

Without discussing politics, he submitted that it would have been better for all concerned if those areas had been opened up in larger blocks. A holding of 4,000, 3,000, or even 2,000 acres would represent a good proposition. At the same time he did not think their position now was to be discounted in any way. When the good seasons came again they would gather big harvests and recover in a manner those battling in other country would never know. Large areas would enable them to husband their country and have something to fall back upon in bad times; but the men on the small holdings could not afford to build up reserves of natural feed and hay, because the opportunities were lacking. There was no question that the hay in those drier areas had a higher feeding value than that grown, say, at Mount Barker, and likewise the natural grass and the cocky chaff were superior. In New Zealand the straw was always stacked in the paddocks so that the stock might nibble at it whenever they liked. How much more should that practice obtain in northern areas of South Australia.

QUESTIONS.

In reply to questions the Director said there was no danger of the phosphoric acid leaching out of the soil. If they put it in one year, and took off no crop, it would be there available for the next crop. The humus and nitrates, however, would be lost. Barley would not malt in the ground so readily as wheat. There was a tendency, however, to attach too much blame to the super. for causing the malting of the grain. The weather was too cold in the winter in this district for rape to do well. Lupins might be tried with advantage. He did not think the use of the thresher practicable in this country.

Mr. C. E. Birks mentioned that he had purchased a thresher to handle from 80 tons to 100 bags per day some 16 years ago. He never worked it with less than ten men. His experience had taught him that it was not worth while touching a crop with this machine unless the average was over 22bush. per acre.

BUREAU WORK.

The Secretary of the Advisory Board (Mr. G. G. Nicholls), in a short address dealing with the work of the Branches, said that whilst districts represented at the Conference had suffered considerably of late, farmers in the Upper North had not lost sight of the value of the Agricultural Bureau. He urged the necessity for conducting the Branches on business lines, and mentioned that the repeated requests received for the sanction of new Branches had forced the Advisory Board to the position of considering whether it might not be necessary to close some of those already existing but displaying little activity, in order to make room for more promising Branches.

VOTE OF THANKS.

At the close of the gathering a comprehensive vote of thanks to the Minister, officers of the Department, members of the Advisory Board, and visiting delegates was accorded with acclamation.

CONFERENCE OF SOUTH-EASTERN BRANCHES.

The South-Eastern Branches of the Bureau held their Annual Conference at Millicent on Wednesday, March 18th. The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), the Director of Agriculture (Professor W. Lowrie, M.A., B.Sc.), the Superintendent of Agriculture in the South-East (Mr. W. J. Colebatch, B.Sc. Agric., M.R.C.V.S.), the Dairy Expert (Mr. P. H. Suter), Messrs. G. R. Laffer, M.P. (Chairman), C. E. Birks, and G. G. Nicholls (Secretary), of the Advisory Board attended, in addition to the following delegates from the Branches undermentioned :—Glencoe—T. F. Gratwick, J. Dow, H. A. Cameron, A. Dow ; Kalangadoo—S. Tucker ; Kybybolite—S. Shepherd ; Millicent—J. Bowering, H. A. Day, H. Hart, G. G. Serle, W. Downs, H. F. L. Holzgrefe ; Mount Gambier—J. H. Buck, W. A. Palamountain, R. P. Pritchard, G. H. Kilsby, A. A. Kilsby, R. Fowler, A. A. Sassanowsky, E. F. R. Schlegel, W. Barrow ; Naracoorte—J. M. Wray, W. E. Rogers ; Penola—D. A. Fullerton, W. Miller ; Tatiara—T. L. Trumann, and a large number of visitors.

CHAIRMAN'S WELCOME.

The President of the local Branch (Mr. J. J. Mullins) occupied the chair. He extended a hearty welcome to the Hon. Minister of Agriculture, who took a great interest in the farming community generally. He felt sure the Bureau was doing a useful work at the present time, and one could not help being struck with this fact when one read the *Journal of Agriculture* and noticed the excellent practical papers that were read at the meetings. He called on the Minister to open the Conference.

MINISTER'S OPENING ADDRESS.

The Hon. T. Pascoe, M.L.C., expressed his pleasure at being present. It spoke well for their earnestness in agricultural matters, he said, when the delegates found time to travel such long distances as they had that day. to attend the gathering. The evidences of prosperity in the district forced one to the view that the South-East must come into its own sooner or later. Hitherto it had not been the unqualified success that many legislators had predicted ; nevertheless, he was convinced that it would eventually become a very important part of the State. They had to put a greater amount of labor into the land than was necessary in districts with lighter soils, but when they had solved the problems with which they were faced their labor would be repaid a hundredfold. The very conditions which made for the success of the South-East this year had resulted in the failure in the North.

The dry seasons had told in favor of the South-East for wheat-growing; but they would find when the drainage system in this district was completed that they would not be so dependent on the seasons as they had been in the past.

More Meat.

If there were any particular branch of the producing industry that promised greater dividends than any other for the work put into it it was the meat industry. Prices had gone up, and would go up still furthur. There must be a tremendous shortage of meat in the old country, and America—which had been the great exporting country of the world—was fast overtaking the supply. Men in these lands were now turning their attention to Australia for supplies, not only for England, but for America itself. He was convinced that a large part of the success in the South-East would be in feeding their crops to stock for marketing as meat. When the railway to Portland was completed they would find this a wonderfully profitable system of working their holdings. He hoped they would have an informative Conference, and declared the meeting open.

THE RELATION OF LIME TO SOUTH-EASTERN SOILS.

The Superintendent of Agriculture in the South-East (Mr. W. J. Colebatch, B.Sc., Agric., M.R.C.V.S.) said—"I know of no subject, unless it be field drainage, that is more deserving of the attention of South-Eastern farmers generally and of this district Conference in particular, than that of soil amelioration through the agency of lime. The progress of our district has in the past been sadly hampered by the periodical inundation of much of our best land. The annual rainfall of the southern portion of the South-East is from 20in. to 30in., and since there are no natural drains of any importance, it follows that the surplus water must either find its way into subterranean passages, or else lie stagnating in and on the soil, to the detriment of both plant and animal life. In order to overcome these natural disadvantages some thousands of pounds are now being invested in the construction of main drainage channels, and the responsibility of turning the benefits thus conferred speedily into profit and of thereby making the venture a reproductive one falls on our shoulders; but, quite apart from these prospective benefits which are to result from the scheme now in hand, there are many who are already in a position to make further use of the information available on the treatment and handling of soils that need draining and sweetening. Land that is subject to more or less complete immersion and water-logging in the winter and spring, and newly reclaimed swamps, require special knowledge and particular methods of working. It would be a complete waste of time and opportunity for men brought up to our northern system to settle on our soils and attempt to work them on similar lines to those to which they have been accustomed; but perhaps it is not necessary to go so far afield to find a want of knowledge, or at any rate if the knowledge is not lacking in our own midst it frequently happens that it is kept too much in the background. Personally, I think it behoves us all to wake up to the fact that we have in the South-East some of the finest forage-growing land in the State, and having in mind the marketing facilities for stock shortly to be provided, and the strong probability that remunerative prices will rule, it is incumbent upon us to study the systems adopted under similar conditions elsewhere, and to embody the results of such experience in our own farm practice. It is because I have a firm conviction that one of the most important operations in the treatment of our soils, namely liming, is being sadly neglected at the present time that I chose this subject to-day.

HISTORICAL.

"The practice of liming land is an ancient one, dating back to the time of the Romans, and it is probable that it was in vogue in China earlier still. It became a regular practice in Great Britain during the 18th century, but about 60 years ago, owing to depressed prices and the introduction of artificial manures, it was to a large extent discarded. It is important to note here that even in those days it was clearly recognised that for lime to be effective the land must first be drained. Storer quotes an early author as saying, 'One most important thing is that lime must never be applied to wet land, or it will be thrown away. The beneficial effect is most strongly marked on newly drained, sour, rushy land with a strong subsoil, and on this and on mixed heaths and bents the fine grasses and white clover spring up plentifully after a good dose of lime.' Towards the close of last century the accumulated residues of crops and artificial fertilisers brought about unhealthy soil conditions, and the steady depletion of lime from the surface soil through leaching and chemical interactions with acid manures led to impaired fertility. The consequence was that the merits of lime were rediscovered, and the operation of liming was gradually reinstated in its proper position. The history of liming in the south-east of South Australia might be written in a very few brief sentences. No doubt odd patches have been tried, but I cannot find any record of systematic work carried out on drained soil with lime of known quality in conjunction with manures, nor can I discover any reports of observations as to the effects of lime on crops or pasture. Opinions based on haphazard trials are not valuable, and should not be regarded as important evidence in relation to the general question.

PHYSICAL EFFECTS OF LIME.

"We shall be in a better position to judge of necessity for applying lime to our soils if we first consider some of its properties. These we will divide into four groups, viz., physical, bio-chemical, physiological, and chemical. The physical effects of lime are most marked on stiff, tenacious clay soils, Lime has the property of inducing the finer clay particles to become aggregated into compound grains, which are in turn held together by the cementing character of the lime. This is termed the flocculating effect of lime, and clay soils are rendered much more friable and pervious when subjected to it. So powerful is lime in effecting these changes that one part will render 10,000 parts of turbid liquid quite clear. It follows, therefore, that a ton dressing will appreciably affect the texture of a soil to a depth of 6in.; the weight of an acre of soil 6in. deep being approximately 900 tons. Clay soils that have been well limed are improved in tilth and drainage, cultivation is easier and less expensive, æration is more perfect, injurious substances are oxidised, bacterial life is encouraged, and the soil is better able to supply moisture to plants as they require it. In addition, the rootage zone is deepened, and as a rule the crops ripen more quickly. In very dry years, however, the deeper rooting habits and the increased supply of water and plant food tend to prolong growth, and so counteract the blighting effects of an early summer. On light open soils lime cements the particles together and increases the water-holding capacity; but this action is less powerful than the flocculating effect on clays, and it is probably of less importance than the binding effect of organic matter on sandy land.

Bio-Chemical Effects.

" In addition to its physical properties lime possesses qualities that enable it to exert an important salutary influence on the germ life in the soil. By maintaining a neutral environment it encourages them to work more rapidly, and thus indirectly influences the soil conditions in relation to plant growth. There are four main groups of soil germs—(1) Those that cause the decay of organic matter. This is a most important group, for if they be retarded putrefactive changes occur and lower oxides and sulphides are formed. These are inimical to plant growth, and the action of lime in preventing their formation and accumulation is therefore an important one. (2) Those that are responsible for the production of nitrites and nitrates from organic nitrogen and ammonia. (3) Those capable of absorbing nitrogen from the air when living in symbiotic union with legumes. (4) Those capable of absorbing nitrogen from the air when living free in the soil. Lime assists all four classes of microbes when present in reasonable quantity, but if a soil be over-limed bacterial life is checked and retrogressive changes may ensue.

Physiological.

" All cultivated plants are not equally appreciative of lime. Some appear unable to tolerate it (*Calcifuges*), whilst others will not thrive in soils that are deficient in it (*Calciphiles*). A good deal of work has been done at Rhode

Island in connection with this subject, and as the result of several seasons' observations the plants have been arranged according to this table :—

Plants benefited—		Plants indifferent—	Plants injured—
Beans	Clover	Maize	Watermelon
Beets	Barley	Millet	Lupin
Celery	Wheat	Rye	Sorrel
Onions	Oats	Potatoes	Serradella
Cabbage	Fruit trees	Carrots	
Pease	Lucerne		

Chemical Effects.

" Lime is an essential plant food, but the amount required by crops is so small that nearly all arable soils contain sufficient to meet this demand for generations. It is believed that a sufficiency of lime in the soil favors the solution of the food materials in the grain and stimulates the young seedling. It is definitely known that indirectly lime is the means of liberating soluble plant food from the soil reserves. It is particularly active in setting free soluble potash, hence its value in encouraging clovers and other legumes. Whether it is appreciably effective in rendering phosphoric acid available is much less certain. Its presence in the soils, and especially in those rich in iron compounds, will undoubtedly check the reversion of water soluble phosphoric acid in added fertilisers to the insoluble phosphates of iron and alumina. Possibly also lime when added to the soil will react on the inert phosphates already formed and gradually bring them within reach of plant growth. Let it be clearly understood, however, that it is not a substitute for artificial manures. With the exception of almost negligible quantities of phosphorus and potash occurring as impurities, lime brings to the soil none of the important elements of plant food contained in artificial fertilisers.

Is Lime a Stimulant ?

" The action of lime in unlocking plant foods stored in the soil without assisting to replenish the supplies has led up to the opinion that it was nothing but a soil-exhausting material which enabled a farmer to profit at the expense of his landlord. The same charge was preferred against nitrate of soda, and in some districts at home tenants were prohibited from using them. The well-known saying that ' Lime enriches the father but beggars the son ' shows how widely that view was held. It is true that the indiscriminate use of lime may prove disastrous. For instance, an excess of caustic lime applied to light land may lead to the burning out of the soil humus and the wastage of nitrogen. Similar losses will occur if it be applied at the same time as dung or soluble nitogenous manures. These disadvantages, however, are attributable to the misuse of lime and not to the material itself. When judiciously employed its action on organic matter will be found highly beneficial and, speaking generally, it may be said that less stress should be laid on the depletion and more on the need for building up the supply of humus, since it is well known that a high condition of fertility can only be secured by the continual breaking down of the complex compounds contained in organic matter. At Rothamsted it was found that limed pasture gained much more nitrogen than unlimed, on account of the stimulus given to the nitrogen-absorbing germs. Again an overdose of lime may lead to the temporary checking of germ activity through excessive alkalinity of the soil moisture. When properly used, however, and when due regard is paid to the important principle that since production is stimutated through liming, a more liberal system of manuring must be adopted, lime will be found to raise the standard of fertility and to promote a healthier and more robust type of vegetation. Thus, whilst the old couplet, 'Lime and lime without manure will make both farm and farmer poor,' is true, it is equally correct to say that on many soils an intelligent combination of lime and manure will prove far more remunerative than the use of artificial fertilisers alone.

Lime Neutralises Soil Acidity.

"Looked at from our own point of view the most important chemical action of lime consists in its power to neutralise the accumulated organic and mineral acids—in other words, to 'sweeten' the land. Soil moisture should be neutral, or only slightly alkaline, in order to favor the growth of vigorous and nutritious herbage. If it be sour or distinctly alkaline bacterial life is checked and fertility reduced. Virgin soils are often fairly productive. even when 'sour,' owing to the abundance of soluble plant food present; but in the course of time this is used up and they tend to become unprofitable for cropping, even though well manured. A 'sour' condition deprives the soil of one of its most important sources of nitrogen by discouraging the growth of legumes. It also favors the spread of undesirable weeds, and in some obscure way diminishes the rate of production of available phosphoric acid. Land that has been long under crop, unless well supplied with carbonate of lime in its original state, will inevitably tend to become sour through the accumulation of crop and fertiliser residues and the gradual dwindling away of the lime compounds. Similarly on grass land the surface tends to become sour; in fact, with the exception of strongly calcareous soils and open sands, in which oxidation is very rapid. most soils under cultivation in humid areas will in time become so heavily charged with organic matter and so poor in lime that some form of alkaline lime will be needed to correct the acid reaction of the soil water.

What Soils Need Liming.

"The percentage of lime in soils varies within very wide limits. In some limestone soils it is present in the form of the carbonate to the extent of over 50 per cent., whilst in other soils it is nearly absent. An average fertile soil will contain from 2 per cent. to 5 per cent. According to Hall, soils containing 1 per cent. or less will all benefit by liming, and when the amount falls below 0·2 per cent. it is essential to lime in order that the manures may exert their full action. It is not possible, however, to decide as to the need for lime solely on the data furnished by a chemical analysis. Without actual field trials it is most difficult to say what effects lime will or will not produce. Wiley, an eminent American agricultural chemist, has stated that two soils apparently identical may be affected in very different degrees, and that actual experiments are the only reliable test. In interpreting analyses it should be noted that only lime in the form of carbonate will be effective in correcting sourness. Much of the lime appearing in the analytical results may have been present in combination with relatively strong acids, and in that state would be of very little value (if any) in neutralising acidity. For rough and ready field work what is known as the 'litmus' test may be resorted to. This consists in mixing a little soil with clean fresh rainwater in a saucer and then letting a piece of blue litmus paper lie in the mixture for 10 or 15 minutes. The paper is then removed, and the adhering soil washed off with rainwater. If the soil be acid the blue color will have changed to red, and the extent of the change is indicative in some measure of the need for lime. In carrying out this trial one must be careful to test the rainwater with litmus first to see that it is neutral; the saucer and spoon must be carefully washed in rainwater, and the fingers must not be allowed to contact with the test paper. If freshly prepared paper be used, and several tests be made, a positive reaction by this method may be regarded as decisive; but experience has shown that it is not safe to be guided by negative results. By far the most satisfactory test, however, is the farm trial plot, and I would urge every South-Eastern farmer who has reason to think that his land is acid to institute an inquiry of this kind this autumn. The trial blocks need not be large. Half or quarter acre plots are best; but the effects will come out quite as well on small plots measuring only a few yards each way. Plots of 40 or 50 square yards, selected on land previously under crop and properly drained, will do well enough. They will require from 20lbs. to 30lbs. of lime, and this must be carefully sown to avoid dust blowing on to adjoining plots. Have the plots three or four yards apart and sow the lime on a calm day. Then work it well in to incorporate it thoroughly with the soil before the seed and manure are sown. The trial should be continued for at least three seasons, as lime does not always demonstrate its effects straight away. In order to bring out the effects clearly it is advisable to sow one of the plots with mangolds or beet, since these crops respond much more quickly than cereals to lime dressings. Generally speaking, it may be said that lime is needed—(1) On heavy soils that drain badly and stick to the plough. (2) On light soils under good rainfall, when sufficient humus is present. (3) On newly-drained reclaimed areas. (4) On soils rich in iron and requiring phosphates. (5) On land that will not support leguminous herbage. (6) On land that has become sour from any cause whatever. Lime is contra-indicated—(1) On light soils deficient in humus. (2) On soils that waterlog and have not been drained. In carrying out preliminary trials different quantities should be used. Sandy soils, as a rule, need only sufficient lime to keep the soil water 'sweet,' and dressings of 10cwts., 20cwts., and 30cwts. per acre should be tried; 30cwts. for light land may appear too heavy, but in the first instance a relatively large amount may be demanded to neutralise the accumulated acids of past years. After the soil has once been sweetened much smaller amounts will be required, say from 5cwts. to 7cwts. every four or five years. On heavy land more lime can be used to advantage; because, in addition to correcting soil acidity, the texture has to be improved and maintained in good order. For this class of soil trials should be made with 1cwt., 1½cwt., and 2cwts. dressings. Subsequently doses of from 10cwts. to 15cwts. per acre every five or six years will be required. Generally it may be taken as true that the deeper the surface soil the more lime should be applied. Probably on some of our heaviest land dressings of 3 tons per acre will not be found too much, but recent experiments have proved that dressings of 4 tons and over are not profitable, even when the results are taken over a series of years.

DURABILITY.

"The tendency of lime to sink through to the subsoil and form a pan is well known, and an examination of the drainage waters reveals the fact that at Rothamsted it is being removed from the soil at the rate of nearly half a ton per acre per annum; or to put it in another way, from four-fifths to five-sixths of the total minerals in the drainage waters from manured soils is lime. Owing to this tendency the proportion of lime in the surface soil soon becomes reduced, and consequently a lime dressing does not exert its maximum influence for very long. However, in a gradually diminishing scale the benefit will be felt for a number of years. In earlier times, before the science of manuring was so well understood, 5 tons or 6 tons of lime were applied at a time, and the effects were discernible a quarter of a century later. The farmers of to-day, however, apply smaller and more frequent doses. In England, under the compensation clauses of the Agricultural Holdings Act, a period of seven years is taken as a basis for calculation.

KIND OF LIME TO USE.

"There are several different varieties of lime available for use on the farm, but they are not equally valuable weight for weight, nor are they equally serviceable under all circumstances. Prior to 1890 burnt or quick lime was chiefly used, but during the last decade of the 19th century the advantage of securing an even distribution of small quantities was realised, and ground quicklime promptly appeared on the market. The risk of adulteration and the corrosive action of the fine powder on the skin, eyes, and throat linings were serious drawbacks, and moreover, it was difficult to preserve in a caustic condition. Early in the present century air-slaked lime came into use as a cheaper and more trustworthy form. It was found to be quite as effective as the ground quicklime for most purposes, but the introduction of ground limestone rock has displaced it to a large extent. The results of a four-year's trial at the Jackson Experimental Station, Tennessee, showed that burnt lime and ground rock, when used in the proportion of 1 to 2, were equally effective, the figures being slightly in favor of the latter. An experiment in Lancashire in 1907 also pointed to the same conclusion.

"Lime is sometimes sold under the name of 'agricultural lime.' This is an indefinite term used to designate a mixture of water-slaked lime, and lime carbonate. Without a certified analysis, however, it quite impossible to calculate its worth. Unfortunately we have no protective legislation in regard to lime, as we have in the case of artificial manures. Standards of quality should be drawn up for all forms of lime sold for the farm, and we should then be in a position to buy intelligently and economically.

"Another material often referred to in this connection is gypsum, or land plaster. It is the sulphate of lime, and is useful under some conditions. Where the object in view is the liberation of potash gypsum will act as powerfully, or even more so, than lime; but as a means of sweetening acid soils gypsum can only be effective according to the percentage of carbonates present as impurities. In acid soils, therefore, it is usually far less efficient than lime carbonate, and, consequently, it cannot be recommended as a substitute for lime for this purpose, even when it can be procured at much less cost. It might be well, however, if a plot dressed with gypsum were included in the system of trial plots previously advocated.

"In judging of the qualities of lime it is noteworthy that limestones often vary considerably, even in the same quarry; the upper and more exposed layers being frequently poorer than those beneath. Again, some stones contain large amounts of magnesia, and are known as dolomitic limestones. It was formerly held that the addition of large amounts of magnesia would upset the natural ratio of lime to magnesia, and so interfere with plant growth. In actual practice, however, no damage has resulted. In Wisconsin the natural stone is all dolomitic, and it is largely employed on the farms. In Dr. Wheeler's Rhode Island experiments it was found that the magnesia was nearly if not quite as effective as air-slaked lime in neutralising acidity, even when applied by itself. For sour land, therefore, it is the percentage of total carbonates that is important, and in a good sample of lime this should not be less than 90 per cent.

"The particular kind of a lime a farmer should use will depend on many things, but the main consideration will always be the cost per unit of quicklime. In coming to a decision on the point the following facts require consideration :—(1) Where the physical action of lime is important, and where rapid action is looked for, the caustic limes are best. (2) On light sandy soils there is a risk of overliming when caustic limes are used. (3) For sour soils any kind of alkaline lime will suit provided sufficient carbonates are applied. (4) One ton of quicklime is equivalent to 2 tons ground rock, or 1½ tons air-slaked lime, or 11·3 tons water-slaked lime. (5) Where freight is heavy the cost of transporting the water and carbonic acid gas in the slaked lime and ground rock may exceed the expense of burning the stone. (6) Ground rock must be finely ground. All should pass through a 10-mesh sieve and 50 per cent. through a 50-mesh sieve.

THE POSITION OF THE SOUTH-EAST IN REGARD TO LIME.

"In the three southern counties of the South-East there are between 150,000 and 175,000 acres under cultivation, and I would venture the opinion that quite one-half of that area would benefit by liming. Yet I very much doubt if as much as 10 tons of lime per year is used to dress farm paddocks. During the last three seasons I have had experience in this matter in the Kybybolite district and on some of the lighter soils of the South-East. We do not require any special investigation to warn us of the deficiency of lime at the Government Farm. The rapidity with which sorrel spreads and flourishes, and the almost total absence of leguminous plants in the fields, affords proof enough and to spare. Further, there is the evidence afforded by the annual quantitative fertiliser trials which show that the soil will not respond to additional quantities of acid manures over 1cwt. There is also the case of one field which received a ton of lime to the acre four or five years ago, and which always produces a little Mount Schanck clover and tares in the stubbles. It is important to note these facts, as our experience will hold good for practically all the land between Frances and Naracoorte. We have also had evidence at Glenburnie, on Mr. Major's plots, that lime is required by the light lands of that district; and with more extended trials I have no doubt the field for liming would expand beyond anticipation.

"Between the Tatiara and the south coast we find such plants as sheep's sorrel and oxalis growing luxuriantly, and many of our grass paddocks are marked by mossy patches. In addition, the character of the native flora—honeysuckle, heath, black grass, 'billy button,' rushes, sedges, and water-grass—is suggestive of the lime requirements of the soil. In many of our lagoons also there is to be seen a reddish-brown deposit, due to the oxidation and precipitation of iron salts which have been dissolved out of the soil by the accumulated vegetable acids. Even on our rich volcanic soils the complaint is often heard that the white clover never comes now like it used to do years ago. Is it not feasible that in such a free draining soil the lime content has now been so reduced that the surface soil is no longer capable of supporting the white clover ? Possibly even here the soil is approaching a critical stage with regard to lime.

"It must, I think, be conceded that the evidence in support of lime deficiency is convincing, and we may congratulate ourselves that the district is well supplied with limestone. Furthermore, the stone is very well distributed, so that freight and haulage should never become a very serious consideration to us. Possibly those with a more prophetic eye can foresee the time when the authorities in our State will emulate the far-seeing attitude of the Dominion of New Zealand, where farmers' lime is carried free of charge in 6-ton truckloads over a distance of 100 miles. Wherever rock containing not more than 10 per cent. of impurities can be obtained it should be made use of, provided it is not too flinty and will yield from 85 per cent. to 90 per cent. total carbonates. With the introduction of pulverisers, such as are in regular use in the 'liming' States of America, it should be practicable to prepare ground rock at from 10s. to 12s. per ton. Crushing and pulverising plants requiring 30-h.p. to 40-h.p. to operate them will yield 5 tons to 7 tons per hour of ground limestone, so finely powdered that 50 per cent. to 70 per cent. of it will pass through a 60-mesh sieve. It is to be hoped that South-Eastern men will give this aspect of the liming question their very serious attention, as the present facilities for obtaining reasonably cheap lime for this district are lamentable, and constitute a serious drag on the wheels of prosperity in this part of the State."

OTHER OPINIONS.

Mr. A. A. Sassanowsky (Mount Gambier) said that although the South-East contained a great amount of limestone the percentage of lime in this was not known. From experiments made at Mr. Major's farm, in this district, it was evident that the addition of lime to the land was beneficial. He thought the Government should provide machinery and crush limestone for the farmers.

Mr. J. B. Mitchell (Millicent) asked the best time to apply lime to the land.

Mr. Colebatch replied that quicklime should be worked into the land before artificial fertilisers were applied, to avoid reversion. A fortnight or three weeks between the applications was sufficient. Ground rock could be put on at any time, provided it was not done too near seeding. Autumn was the best time.

Mr. G. H. Kilsby (Mount Gambier) asked whether lime from different parts of the district could be analysed.

The Director of Agriculture said the Government was subsidising two institutions for the purpose of doing analyses. Considerable numbers of analyses were made nearly every week, and it was simply a matter for them to send up one or two pounds of the material to be analysed, giving a description of the place from which it was taken and the purpose for which the analysis was wanted. They would then get the information free of charge.

With regard to Mr. Sassanowsky's suggestion that the Government should secure a milling plant and crush limestone, it was his opinion that farmers could do this work much more cheaply themselves. The few hundred pounds that would be necessary would be very easily secured. In New Zealand the practice was for the farmers to do work such as this co-operatively.

CARE OF WHEELS.

This subject was dealt with by Mr. T. L. Truman (Tatiara) in a paper which has already been printed on page 722 of the February, 1911, issue of the *Journal*. In reply to a question, the writer of the paper said the most satisfactory method of dealing with loose boxes of wheels was to put in wedges made from the timber of a kerosine case, or something similar. If there were insufficient space to allow of this, he would use pieces of bagging or hessian.

FRUIT-GROWING.

Mr. G. R. Laffer, M.P. (Chairman of the Advisory Board), in the course of a short address, mentioned that there was practically no limit to the production of fruit in this State. The difficulty with which they were confronted, however, was the small scope for marketing. The question of pruning was dealt with, the speaker mentioning that in the natural state of the trees an equilibrium existed between the growth of the tree and the root action. The aim of the orchardist should be to secure a sufficient immediate extension of the growth of the tree, and at the same time make provision for coming seasons. A tree left unpruned would bear a heavy crop one year and a light one the next, but this method of fruit-growing would not be found profitable. Regular crops, year in and year out, were desirable. This was best done by taking away sufficient of the branches to place the balance of power with the roots, and so enabling the tree not only to produce a crop but make growth. The export-trade, to which they had to look to a large extent for a market for their fruit, carried with it numerous difficulties. Transit was not only very expensive, but there was the risk of the fruit deteriorating on the voyage.

Mr. J. Bowering inquired whether there was a known remedy for bitter pit.

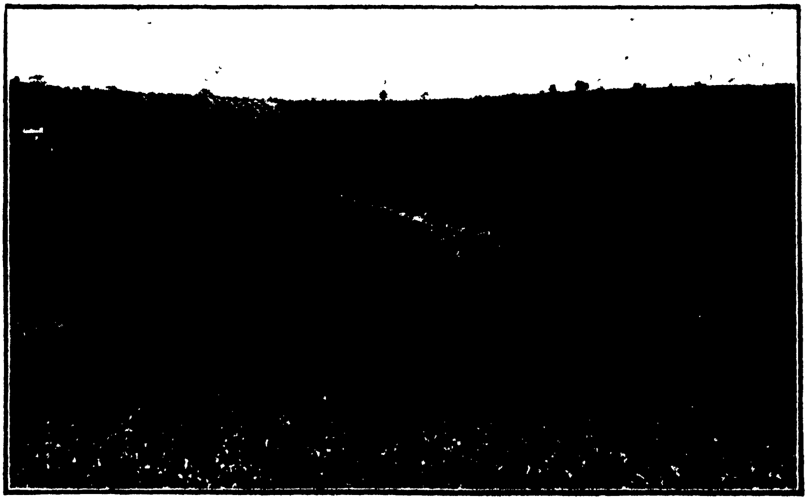
Mr. Laffer said that so far there had been no remedy found for this disease. Professor MacAlpine was investigating and doing a most valuable work in connection with this matter. The speaker's opinion was that the bitter pit was most troublesome where very hard pruning was practised.

Mr. J. M. Wray (Naracoorte) asked whether apricots of very vigorous growth should be pruned.

Mr. Laffer replied that excessive growth could be checked by judicious summer pruning, but the leaders should not be pruned. Apricots, peaches, and almonds had been very much affected during the past few years by a fungus which attacked the buds and caused them to become black. In a wet district it would be found necessary, in order to check this, to spray the trees twice during the winter with Bordeaux mixture.

Mr. R. Fowler explained methods of thinning and summer pruning that had been successfully adopted in the South-East.

(*To be continued.*)



Vineyards, Near Adelaide.

THE WHEAT MARKET.

Commenting on the wheat position, *Beerbohm's Evening Corn Trade List* of March 6th states—"Shipments last week were moderate, and compared unfavorably with the total in the corresponding week last year, but the total to date, so far as Europe is concerned, is still over 1,000,000 quarters larger than in the previous season, when the estimated requirements were several million quarters more than for the present season. Imports were quite small, and well below the requirements, but the returns of stocks held at the principal ports show that the quantity delivered during the month was about 150,000 quarters less than expected. According to a report from Odessa, it was estimated that there was still about 60 per cent. of the surplus from the last Russian crop available for export at the end of February. The exports having amounted to about 11,500,000 quarters, on this basis there would be about 17,000,000 quarters still to come forward, making a total of 28,500,000 quarters for the whole season. If this estimate be approximately correct, it would follow that the last crop was a little over 100,000,000 quarters, instead of 122,000,000 quarters, as per the official estimate. The quantity of wheat exported from the United States and Canada in the six months ended January 31st, according to the official reports, amounted to about 23,000,000 quarters, including 11,900,000 quarters from Canada, and 11,100,000 quarters from the United States. In the corresponding six months of the previous season, the official figures gave the exports from both countries at 18,500,000 quarters, whilst the actual shipments as cabled amounted to 18,400,000 quarters, or practically the same as the official export figures. The second Indian official reports for most of the important wheat-growing districts have been received this week, but being less complete than usual, it is impossible to form a definite opinion as to the actual deficiency in the yield compared with last year. It is quite clear, however, that there will be a serious shortage, especially in the United Provinces and the Central Provinces (the two districts which have suffered most), amounting to between 5,000,000 and 10,000,000 quarters. The world's visible supply decreased 425,000 quarters last month, against an increase last year of 945,000 quarters, and an increase in 1912 of 210,000 quarters. The European quantity shows an increase, but there has been a sharp decrease in the American visible."

The World's Visible Wheat Supply on March 1.

	European. Quarters.	U.S.-Canada. Quarters.	Total. Quarters.	Eng. Average Price.
1914......	9,965,000	14,200,000	24,165,000	31/
1913......	10,380,000	14,820,000	25,200,000	31/
1912......	8,575,000	14,600,000	23,175,000	34/1
1911......	12,255,000	9,200,000	21,455,000	30/2
1910......	10,035,000	6,570,000	16,605,000	32/7
1909......	9,180,000	8,400,000	17,580,000	34/6
1908......	10,745,000	7,500,000	18,245,000	32/
1907......	9,055,000	10,050,000	19,105,000	26/9
1906......	9,220,000	9,250,000	18,470,000	28/10
1905......	9,620,000	7,125,000	16,735,000	30/10
1904......	8,600,000	7,450,000	16,050,000	27/10
1903......	6,832,000	10,190,000	17,022,000	25/3
1902......	8,640,000	11,230,000	19,870,000	27/1
1901......	9,090,000	10,960,000	20,050,000	25/11
1900......	7,605,000	11,675,000	19,280,000	26/3
1899......	7,720,000	7,025,000	14,745,000	25/7
1898......	8,148,000	6,400,000	14,548,000	35/5

Date.		LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
March	2	—	3/8½ to 3/9	3/8½ to 3/9	3/8½ to 3/9
	3	Very dull and lower to sell; Liverpool dull	Do.	Do.	Do.
	4	Quiet	3/9	3/8¾ to 3/9	3/9
	5	Dull, with easier tendency	Do.	Do.	3/8½ to 3/9
	6	Dull; Liverpool dull, no demand	3/9	Do.	Do.
	7	Market neglected and lower to sell	Do.	Do.	Do.
	9	—	Do.	3/8½ to 3/9	3/8½
	10	Quiet	3/8½ to 3/9	Do.	Do.
	11	Dull and neglected	Do.	Do.	3/8½ to 3/9
	12	Steadier tone, not active; Liverpool steady but quiet	Do.	Do.	Do.
	13	Quiet; Liverpool dull and neglected	Do.	Do.	Do.
	14	Dull, easier tendency; Liverpool quiet	Do.	Do.	Do.
	16	—	3/8½	Do.	Do.
	17	Dull and offered lower; Liverpool quiet	Do.	Do.	Do.
	18	Steady, but quiet	Do.	Do.	Do.
	19	Steady, but quiet	Do.	Do.	Do.
	20	Quiet; Liverpool steady but quiet	Do.	Do.	Do.
	21	Steadily held, but not active	Do.	3/8¾ to 3/9½	3/8¾ to 3/9½
	23	—	Do.	Do.	Do.
	24	Quiet	Do.	Do.	Do.
	25	Quiet, March-April 4/6; Liverpool steadily held, not active	Do.	3/8½ to 3/9¼	3/8½ to 3/9¼
	26	Quiet	Do.	Do.	Do.
	27	Steady, but quiet; February-March, 4/6; Liverpool steadily held, not active	Do.	Do.	Do.
	28	Steady, but quiet	Do.	Do.	Do.
	30	—	Do.	Do.	Do.
	31	Steady, but quiet	Do.	Do.	Do.
April	1	Very dull; Liverpool quiet	3/8 to 3/8½	3/8½ to 3/9	3/8¾
	2	Dull, easier tendency	Do.	3/8½ to 3/8¾	Do.
	3	Dull, lower to sell; Liverpool dull, no demand	Do.	Do.	3/8½ to 3/8¾

Steamer Freights.—(April 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 22s. per ton (7d. per bushel); to South Africa, 20s. per ton (6⅜d. per bushel). Parcels, Port Adelaide to London-Liverpool, or Continent, 20s. per ton (6⅜d. per bushel); Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel); to Sydney, 10s. 6d. per ton (3⅜d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 21s. 3d. per ton (6⅞d. per bushel); South Africa, 20s. per ton (6⅜d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on April 1st—

Butter.—The continued heat experienced throughout the month materially interfered with quantities of fresh butter coming forward, so that it was necessary to bring along importations to meet the demand. Values in top qualities show only slight fluctuations, but second and third grades are finding a better inquiry. Present values are:—Alfa, 1s. 4½d. per lb.; Primus, 1s. 3½d.; choice separators and dairies, 1s. to 1s. 1d.; store and collectors', 8½d. to 9½d. per lb.

Eggs show a seasonable improvement, with prices recording an advance of 2d. to 3d. per dozen during the month. Hen are selling at 1s. 3d. per dozen; duck, 1s. 4d.

Bacon is receiving better attention locally, and as the factories' stocks have been very much reduced rates have firmed to the extent of 1d. per lb. Quotations—Best factory cured sides, 9½d. to 10½d. per lb.; hams, 11d. to 1s. 1d.; lard in skins, 8½d.; bulk, 7d.

Honey.—Competition has been very brisk both for local and export, supplies not being nearly equal to oversea orders. Prime clear extracted brought 3d. to 3¼d. per lb.; beeswax, 1s. 2½d.

Almonds.—Although heavier parcels are coming to hand, and values rule higher, the brisk demand keeps stocks from accumulating. Brandis are selling at 6½d.; mixed softshells, 6d.; hardshells, 3d.; kernels, 1s. 4½d. per lb.

Live Poultry.—Supplies kept up remarkably well for the time of the year, the catalogues throughout the month being very extensive. This attracted a large attendance of buyers both for local and oversea trade, so that nice rates were secured. Good table roosters brought 3s. to 3s. 6d. each; plump cockerels, 1s. 9d. to 2s. 3d.; hens, 1s. 8d. to 2s. 4d.; ducks, 1s. 9d. to 2s. 6d.; geese, 3s. 6d. to 4s. 3d.; pigeons, 6½d.; turkeys—hens, 4s. to 6s. each; gobblers, 9s. to 12s. each.

Potatoes and Onions.—Potatoes have been decidedly scarce and values have appreciably firmed. Current opinion is that the havoc wrought by grubs, and the exceptionally warm summer, will effectively prevent the late crops from giving anything more than moderate results. Onions.—The demand for export has fallen off, but a good local inquiry has kept the market steady. Present quotations—Potatoes, £5 10s. per ton of 2,240lbs. on trucks Mile End or Port Adelaide: 6s. to 7s. per cwt. in the market. Onions—£7 per ton of 2,240lbs. on trucks Mile End or Port Adelaide; 6s. 6d. to 7s. 6d. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of March, 1914, also the average precipitation to the end of March, and the average annual rainfall.

FAR NORTH AND UPPER NORTH.

Station.	For March, 1914	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Oodnadatta	—	2·59	1·83	4·76
Tarcoola	0·08	0·08	1·35	7·58
Hergott	2·19	3·58	1·47	6·04
Farina	1 54	1·91	1·78	6·70
Leigh's Creek	1·11	1·46	1·96	8·66
Beltana	0·26	1·14	2·28	9·22
Blinman	0·28	1·28	2·77	12·85
Hookina	0·20	1·03	—	—
Hawker	0·21	0·67	1·65	12·22
Wilson	0·11	0·29	1·83	11·78
Gordon	0·25	0·46	1·79	10·26
Quorn	0·08	0·59	1·70	13·78
Port Augusta	0·68	0·99	1·75	9·46
Port Augusta W.	0 46	0·80	1·45	9·36
Bruce	0·26	0·99	1·71	10·01
Hammond	0·25	0·75	1·82	11·46
Wilmington	0·15	0·47	2·16	18·26
Willowie	0·28	0·69	1·90	11·90
Melrose	0·12	1·57	3·20	23·04
Booleroo Centre	0·16	0·63	1·99	15·83
Port Germein	0·32	0·62	1·82	12·84
Wirrabara	0·29	1·61	2·24	18·91
Appila	0·15	0·68	2·24	15·08
Cradock	0·13	0·54	1·77	10·86
Carrieton	0·24	0·76	1·78	12·22
Johnburg	0·27	1·41	1·49	10·21
Eurelia	0·29	0·51	1·90	13·24
Orroroo	0·33	0·97	2·27	13·42
Black Rock	0·62	1·39	1·99	12·25
Petersburg	0·38	1·89	2·04	13·07
Yongala	0·43	1·33	1·87	13·94

NORTH-EAST.

Station.	For March, 1914	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Ucolta	0·68	0·80	—	—
Nackara	0·72	1·12	—	—
Yunta	0·88	0·99	1·72	8·22
Waukaringa	0·71	1·45	1·59	7·94
Mannahill	0·50	1·20	1·75	8·46
Cockburn	0·73	1·98	1·80	7·97
Broken Hill, NSW	0·33	0·73	2·23	9·63

LOWER NORTH.

Station.	For March, 1914	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Port Pirie	0·53	0·79	1·86	13·21
Port Broughton	0·61	0 83	1·85	14·33
Bute	1·11	1·36	1·79	15·42
Laura	0·38	0·88	2·20	18·22
Caltowie	0·21	0·68	2·17	17·27
Jamestown	0·40	0·99	2·15	17·46
Gladstone	0·45	0·69	1·94	16·00
Crystal Brook	0·79	1·00	1·89	15·62
Georgetown	0·58	0·94	2·24	18·32
Narridy	0·60	0·76	2·05	16·79
Redhill	0·71	1·09	2·90	16·79
Spalding	0·40	0·78	2·36	20·25
Gulnare	0·29	0·56	2·12	19·74
Bundaleer W. Wks.	0·26	0·37	2·02	17·29
Yacka	0·22	0·53	1·77	15·27
Koolunga	0·54	0·96	1·99	15·94
Snowtown	1·21	1·33	1·85	15·70
Brinkworth	0·63	0·90	1·94	15·48
Blyth	0·65	0·79	2·01	16·34
Clare	0·45	0·82	2·77	24·30
Mintaro Central	0·50	0·67	2·29	21·99
Watervale	0·60	1·03	2·81	27·17
Auburn	0·48	0·92	3·02	24·25
Hoyleton	0·39	0·52	2·19	17·96
Balaklava	0·88	1·16	2·02	16·03
Port Wakefield	1·25	1·61	2·16	13·13
Terowie	0·48	1·16	2·10	13·71
Yarcowie	0·38	1·77	2·06	13·91
Hallett	0·15	1·16	1·97	16·40
Mount Bryan	0 67	1·70	1·92	15·73
Burra	0·27	0·84	2·39	17·82
Farrell's Flat	0·55	0·89	2·26	18·87

WEST OF MURRAY RANGE.

Station.	For March, 1914	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Manoora	0·42	0·92	2·17	18·09
Saddleworth	0·34	1·06	2·52	19·69
Marrabel	0·78	2·27	2·14	18·94
Riverton	0·67	1·39	2·47	20·48
Tarlee	0·64	2·43	2·23	17·48
Stockport	0·93	2·43	2·07	15·89
Hamley Bridge	0·75	1·82	2·19	16·45
Kapunda	0·87	4·11	2·53	19·67
Freeling	0·64	1·55	2·23	17·85
Greenock	0·82	2·28	2·37	21·46
Truro	0·66	2·35	2·21	19·74
Stockwell	0·95	2·28	2·23	20·30
Nuriootpa	0·89	2·13	2·34	21·25
Angaston	1·25	2·45	2·36	22·25
Tanunda	1·02	2·44	2·58	22·28
Lyndoch	1·18	2·13	2·25	23·01

ADELAIDE PLAINS.

Station.	For March, 1914	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Mallala	1 03	1 83	2 11	16·88
Roseworthy	0·74	1·97	2·14	17·31
Gawler	0·78	2·60	2·36	19·21
Two Wells	0·81	1·71	2·05	16·36
Virginia	0·63	1·61	2·19	17·58
Smithfield	0·73	1·46	2·25	17·30
Salisbury	0·74	1·40	2·35	18·52
North Adelaide	1·46	2·96	2·47	21·49
Adelaide	1·09	2·50	2·39	21·04
Brighton	0·64	1·42	2·47	19·93
Glenelg	0·82	1·64	2·26	18·35
Magill	1·05	2·79	2·85	25·69
Glen Osmond	0·89	2·39	2·63	25·20
Mitcham	1·09	2·16	2·42	23·47
Belair	1·09	1·32	3·00	28·64

RAINFALL—*continued.*

MOUNT LOFTY RANGES.

Station.	For March, 1914.	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Houghton	—	—	—	—
Teatree Gully	0·78	2·15	3·23	28·19
Stirling West	1·09	2·98	4·46	46·70
Uraidla	0·77	3·15	4·44	44·35
Clarendon	0·92	1·81	3·52	33·67
Morphett Vale	0·84	1·84	2·66	23·32
Noarlunga	0·74	1·21	2·26	20·28
Willunga	0·75	1·29	2·74	25·98
Aldinga	0·52	1·25	2·36	20·34
Normanville	1·49	2·21	2·13	20·65
Yankalilla	1·80	1·97	2·50	22·78
Cape Jervis	1·63	1·90	1·62	16·34
Mount Pleasant	0·42	2·20	2·70	26·87
Blumberg	0·61	3·15	3·00	29·38
Gumeracha	0·72	2·45	3·21	33·30
Lobethal	0·58	2·11	3·13	35·38
Woodside	0·60	2·39	3·08	31·87
Hahndorf	0·58	2·07	3·35	35·45
Nairne	0·53	2·56	3·33	28·83
Mount Barker	0·68	2·48	3·31	30·93
Echunga	0·69	2·22	3·42	32·83
Macclesfield	0·59	2·63	3·15	30·72
Meadows	0·65	2·91	3·74	35·52
Strathalbyn	0·49	1·42	2·48	19·28

MURRAY FLATS AND VALLEY.

Station.	For March, 1914.	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Wellington	0·81	2·04	2·24	15·01
Milang	0·89	1·09	2·12	16·08
Langhorne's Bdge	1·05	2·84	2·07	15·27
Tailem Bend	0·98	2·40	—	—
Murray Bridge	0·88	1·87	2·15	14·32
Callington	0·62	2·07	2·22	15·65
Mannum	0·73	2·11	1·86	11·67
Palmer	0·56	2·08	2·23	15·60
Sedan	0·44	1·59	1·62	11·92
Blanchetown	0·19	0·64	1·94	10·71
Eudunda	0·67	1·63	2·16	17·33
Sutherlands	0·50	1·77	1·40	10·60
Morgan	0·41	0·93	1·51	9·29
Overland Corner	1·98	2·23	2·02	11·42
Renmark	1·21	1·38	1·81	10·93
Loxton	0·85	0·96	—	—

WEST OF SPENCER'S GULF.

Station.	For March, 1914.	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Eucla	0·52	0·85	2·16	10·13
White Well	0·85	0·88	1·58	9·67
Fowler's Bay	0·67	0·71	1·32	12·11
Penong	1·54	1·62	1·39	11·93
Murat Bay	0·99	1·13	—	—
Smoky Bay	1·15	1·20	—	—
Streaky Bay	1·43	1·43	1·54	15·31
Port Elliston	1·48	1·52	1·39	16·49

WEST OF SPENCER'S GULF—*continued.*

Station.	For March, 1914.	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Port Lincoln	0·90	1·14	2·06	19·88
Tumby	2·08	2·31	1·50	15·00
Carrow	1·68	2·05	—	—
Cowell	1·01	1·82	1·75	11·76
Point Lowly	0·48	0·66	2·01	12·21

YORKE'S PENINSULA.

Station.	For March, 1914.	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Wallaroo	0·74	1·00	1·83	14·05
Kadina	0·73	1·14	1·84	15·88
Moonta	0·85	1·60	1·84	15·22
Green's Plains	0·65	0·88	1·69	15·73
Maitland	0·90	1·42	2·04	20·08
Ardrossan	0·73	1·28	1·65	13·89
Port Victoria	1·00	1·70	1·60	15·20
Curramulka	1·24	1·86	2·02	18·51
Minlaton	1·24	2·03	1·75	17·41
Stansbury	1·16	1·72	1·86	17·06
Warooka	1·59	2·26	1·59	17·71
Yorketown	1·91	2·23	1·66	17·47
Edithburgh	1·66	2·22	1·87	16·48

SOUTH AND SOUTH-EAST.

Station.	For March, 1914.	To end March, 1914.	Av'ge. to end March.	Av'ge. Annual Rainfall
Cape Borda	0·80	1·15	2·19	25·09
Kingscote	1·82	2·04	1·77	18·95
Penneshaw	1·40	1·91	2·23	21·34
Cape Willoughby	1·09	1·34	2·16	19·69
Victor Harbor	0·75	1·70	2·56	22·18
Port Elliot	0·63	1·24	2·45	20·33
Goolwa	0·72	1·88	2·33	17·93
Pinnaroo	0·64	1·02	2·59	16·74
Parilla	0·87	1·35	—	—
Lameroo	0·91	1·62	2·09	16·55
Parrakie	0·91	1·39	—	—
Geranium	1·32	1·85	—	—
Peake	1·62	2·23	—	—
Cooke's Plains	0·94	1·85	2·06	14·74
Meningie	0·82	1·14	2·20	18·87
Coonalpyn	1·62	3·25	2·07	17·49
Tintinara	1·69	2·21	2·31	18·78
Keith	1·93	2·73	—	—
Bordertown	1·21	1·69	2·17	19·76
Wolseley	1·10	2·62	1·86	17·72
Frances	1·85	2·67	2·32	20·74
Naracoorte	1·96	3·01	2·56	22·60
Penola	0·91	1·26	3·24	26·78
Lucindale	0·86	1·35	2·46	23·32
Kingston	2·15	2·98	2·45	24·73
Robe	2·58	3·46	2·53	24·69
Beachport	2·65	3·52	3·02	27·51
Millicent	2·19	4·11	3·31	29·25
Mount Gambier	1·46	1·36	4·04	32·00
C. Nrthumberland	1·89	3·07	3·02	26·63

AGRICULTURAL BUREAU REPORTS.

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Arden Vale & Wyacca	*	—	—	Hookina	*	7	5
Arthurton	*	—	—	Inman Valley	1001	—	—
Balaklava	991	—	—	Ironbank	†	10	8
Beetaloo Valley	983	—	—	Julia	988	11	—
Belalie North	*	4	9	Kadina	‡	7	5
Berri	995	4	9	Kalangadoo	*	11	8
Blackwood	999	13	11	Kanmantoo	*	4	9
Blyth	987	4	2	Keith	†	11	9
Booleroo Centre	*	—	—	Kingscote	*	7	5
Borrika	†	—	—	Koppio	993	—	—
Bowhill	*	—	—	Kybybolite	1006	9	7
Burra	*	10	8	Lameroo	997	—	—
Bute	*	—	—	Laura	*	10	8
Butler	*	—	—	Leighton	*	—	—
Caltowie	*	4	9	Lipson	*	—	—
Canowie Belt	*	—	—	Longwood	1001	8	6
Carrieton	*	9	7	Loxton	*	—	—
Cherry Gardens	1005	7	5	Lucindale	*	11	16
Clanfield	*	—	—	Lyndoch	†	9	7
Clare	991	10	8	MacGillivray	1001	—	—
Clarendon	*	6	4	Maitland	991	2	7
Claypan Bore	*	—	—	Mallala	989	6	4
Colton	*	11	9	Mangalo	*	—	—
Coomandook	995	—	—	Mannum	*	25	30
Coomooroo	*	11	—	Mantung	*	—	—
Coonalpyn	*	—	—	Meadows	†	7	5
Coonawarra	*	—	—	Meningie	1002	11	9
Coorabie	992-5	—	—	Millicent	*	14	12
Cradock	*	—	—	Miltalie	993	4	9
Crystal Brook	*	—	—	Minlaton	*	9	7
Davenport	982	—	—	Mitchell	*	11	9
Dawson	*	—	—	Monarto South	999	4	—
Dingabledinga	*	10	8	Monteith	*	—	—
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Freeling	*	—	—	Mount Barker	1005	8	6
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Georgetown	*	11	9	Mount Gambier	1005	—	—
Geranium	996	25	30	Mount Pleasant	1003	10	8
Gladstone	*	—	—	Mount Remarkable	982	8	6
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North Booborowie	*	—	—	Sutherlands	*	4	9
North Bundaleer	*	—	—	Tarcowie	982	7	5
Northfield	990	7	5	Tatiara	*	4	2
Orroroo	*	—	—	Tintinara	*	—	—
Parilla	999	—	—	Two Wells	*	-	—
Parilla Well	*	—	-	Uraidla and Summert'n	*	6	4
Parrakie	999	4	2	Utera Plains	994	4	9
Paskeville	*	9	7	Waikerie	*	—	—
Penola	†	4	2	Warcowie	*	—	—
Penong	†	11	9	Watervale	991	—	—
Petina	*	—	—	Wepowie	983	—	—
Pine Forest	992	7	5	Whyte-Yarcowie	986	—	—
Pinnaroo	*	—	—	Wilkawatt	†	—	—
Port Broughton	987	10	8	Willowie	*	3	1
Port Elliot	1005	18	16	Willunga	*	4	2
Port Germein	984	11	16	Wilmington	983	8	6
Port Pirie	984	—	—	Wirrabara	986	11	9
Quorn	*	-	—	Wirrega	*	—	-
Redhill	985	7	5	Woodside	*	—	—
Renmark	*	—	—	Wynarka	*	—	—
Riverton	990	—	—	Yabmana	*	—	—
Roberts and Verran	994	—	—	Yadnarie	994	4	9
Saddleworth	*	17	15	Yallunda	*	4	—
Salisbury	*	7	5	Yongala Vale	987	6	4
Shannon	*	—	—	Yorketown	†	11	9
Sherlock	*	—	—				

* No report received during the month of March. † Formal report only received.
‡ Held over until next month.

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ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

April 8th and May 13th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

DAVENPORT (Average annual rainfall, 9in. to 10in.).

February 15th.—Present: seven members.

Agriculture, Past and Present.—Mr. Bothwell read a paper under this heading, in which he traced the evolution of agricultural practice from the time when primitive implements were employed and smaller areas were crudely cultivated to the present day, when immense steam implements were employed and motor power brought to grapple with the work of tilling the soil and harvesting and preparing its products. He claimed that the farmer of the present day was a man with a keen knowledge of his business, knowing the constituents of the soil and what it lacked. He was able to apply the required fertilisers, and thus secure the best returns. The writer of the paper also paid a tribute to technical agricultural education. The outlook of the farming community was better than in bygone years, and the better conditions had now given more leisure for social intercourse and amusement, rendering farm life more attractive and tending to counteract the migration from rural districts to the city.

MOUNT REMARKABLE (Average annual rainfall, 14·48in.).

February 12th.—Present: 12 members.

Veitch's Well Experimental Farm.—Mr. H. H. Davies, who had recently visited the Government Experimental Farm at Veitch's Well, gave his impressions. As harvesting had not been completed he was unable to quote results, but was much impressed by the nature of the work being done, particularly in the plots put down to test the relative value of different varieties of wheat. The farm consisted of a succession of sandhills, or sandridges, with intervening flats from five or six chains to a quarter of a mile wide. The sandridges ran, roughly, east and west. The flats showed a surface of drab, grey, or brown loam, with here and there limestone outcrops. The timber was chiefly mallee with a sprinkling of pine, needlebush, sandalwood, bootlebrush, and titree. Porcupine tussocks were plentiful, and, with the stumps left from clearing, helped to add a dash of sensation to the drive along the bush track. The mallee ranged in size from whipsticks of 7ft. or 8ft. in height to a size large enough to provide fence posts.

TARCOWIE (Average annual rainfall, about 15½in.)

March 10th.—Present: 16 members.

Farm Implements and Machinery.—Mr. Breuer contributed a paper on this subject. He favored a skim plough of up to 12 furrows. The body of this should be easily removable. Seven furrows were enough for fallowing, and when the ploughing was finished the body could be replaced and the implement used for working back the fallow. The skim plough was better than the cultivator for killing weeds, and it worked the soil better. At seeding time if the prong boards, which were only held by a stud and a bolt, were removed, the implement could be used as a cultivator. If the land on the farm was rough, a set of jump harrows was of more value than set harrows, although the latter destroyed weeds and broke clods better. On a paddock thick with weeds last year he had used this implement, and very few weeds had grown. It was much quicker to work this than the plough or cultivator, and the land was worked to a level condition. With the drill the seed and manure could be sown at the same time, and at an even depth. He preferred a four-horse drill, with hoes not more than 7in. apart. Many varieties of wheat did not stool out, but grew straight, and for this reason he was in favor of the closer hoe drill. The binder, in his opinion, was one of the most improved machines on the market. It saved the farmer a large amount of labor, and did not waste nearly as much hay as the old-style cutter. The one advantage with loose hay was that it was boxed about more, and the stock did not eat off the heads. The harvester had great advantages over the ordinary stripper. One man with a team of four horses could reap and clean the wheat, and where the crops were not too dirty, could produce as good a sample as the winnower. If the stripper were used, two extra men would be required to work the winnower, and this would prolong the harvest considerably. A greater area could be reaped each day with the harvester than with the stripper. Most harvesters were fitted with self-lubricators, and there was now no trouble in this direction. There was generally a large amount of carting to be done, and a wagon with a 2¾in. axle and 3½in. by 1in. tyres which would carry from 70 to 80 bags of wheat would be found most suitable. In the discussion which followed Mr. Burgess contended that the ordinary plough and cultivator was a better combination than the skim plough and cultivator harrows. Mr. Müller favored the skim plough, as the land remained level, was pulverised better, and provided a better seedbed. Mr. Bennett considered that the skim plough, followed by the scarifier harrows, would do good work if the land were in good condition.

WEPOWIE (Average annual rainfall, 13in. to 14in.).

March 17th.—Present: 10 members and five visitors.

Harvester v. Stripper.—Mr. Goss contributed a paper on this subject, in which he stated that in a fair crop the harvester had many advantages over the stripper. It saved labor, and the wheat could be removed at once from the paddock. There was also less danger from fire and storms. With the harvester reaping could be commenced quite two hours earlier in the mornings than with the stripper. The great drawback was the loss of the cocky chaff, but he had found that good clean bound straw was better than cocky chaff. The motor winnower made no better sample and wasted as much, if not more, wheat than the harvester. A crop could be harvested in about half the time and at much less expense with this machine. Bags should be sewn and carted direct to market, even if it were necessary to hire a team. No risks were then taken of damage by fire and floods. If a competent man were working the harvester there was little wear and tear on the machine, and very little waste of grain.

WILMINGTON, February 12th.—**Ensilage.**—Mr. P. Pickering read a paper which will be found printed on page 945 of the current issue.

WILMINGTON, March 11th.—**The Farm Employé.**—Mr. D. S. George read the paper on this subject written by Mr. V. R. Weston, of the Coorabie Branch, and printed on page 627 of the December, 1913, issue.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

March 9th.—Present: seven members and one visitor.

Poultry-Breeding.—Mr. C. Cox contributed a paper on this subject, in which he said that one of the first considerations for the intending poultry farmer was to study the breeds most suitable for his district. He favored a cross between the Brown or White Leghorn and the Black Orpington for this district. Good all-round fowls would be obtained from this cross. From crossbreds a better percentage of chicks, as well as healthy and hardy birds were obtained. He preferred the incubator for hatching, although it required plenty of care and attention. A brooder was also of value. Chickens should receive plenty of green feed, such as lucerne, rape, &c., preferably chaffed. Houses should be erected on sandy or gravelly land if the birds were to be enclosed. They should have a large run and plenty of scratching litter. Fowls kept in open fields picked up a considerable portion of their food in the form of insects and grass, and were more vigorous and free from disease. A good whitewashing with lime kept vermin away. The food should be good, clean, and wholesome, and inferior or damaged grain was not profitable for feeding to birds. Mr. Ryan thought the White Leghorn the best breed for both laying and table purposes. Mr. Murphy considered good housing essential.

PORT GERMEIN (Average annual rainfall, 12·84in.).

March 16th.—Present: five members and one visitor.

FALLOWING.—Mr. W. J. McDougall read a paper as follows:—" I do not believe in the so-called dry farming as opposed to our system of fallowing, in this district at all events. Our rainfall is at times too low to warrant the expense and work needed under the dry farming system. Fallowing, if done thoroughly, will give about the same results generally. However, we may improve our own system. We have only to look back a few years and find a very different style of fallowing to that in vogue at the present time. At one time the land was simply ploughed up roughly, and perhaps harrowed once, and that was thought sufficient for perhaps three or four years' cropping. At the present time most farmers fallow every second year, and some maintain that the land should only grow one crop in three years, and that always on fallow. From my own observation and experience I find in this district the most profitable way is fallowing every second year with one crop, on heavy land, with an occasional rest, say every five years, but on sandy soil I think it better to get two crops off the one fallowing. Thus the stubble is on the land the second year to check drift. Fallowing should begin early in the year, as soon after seeding as possible. More of the winter's moisture is conserved, and weeds have a better chance to germinate. I know some farmers contend that if they start fallowing early in the winter they plough up too much of their feed, but I have noticed that generally more feed will grow on the land if it is worked early in the winter than if it is left lying idle. Do not plough it too deep; in this district I do not think it wise to plough very deep, except in very wet seasons. In fact, I prefer to skim plough the land if it can be done in June or early in July, and plough it deeper later in the year if the season is wet; if it is not wet work it shallow right through the year. There is an old English saying that corn seed should have a ' hard bed and a soft blanket,' and I think that also applies to Australia. The seed bed should be firm underneath and loose on the surface, and to get that result we need to fallow early while the land is wet, and work the surface down fine afterwards. Do not work the fallow while it is dry if it can be avoided. It seems to be more subject to takeall if ploughed dry. It makes no difference what kind of plough is used to break the land up in the first instance, but the tine cultivator and harrow are the best implements to work the land down after it is once ploughed. Those implements tend to give the land a firmer seed bed by bringing the lumps and rubbish to the surface, and allowing the fine soil to go down to the bottom. This has several advantages; on stiff land, the rough stuff being on top helps to keep the land from running together on top; and on light land the cultivator leaves a rougher surface so that it is not so liable to drift. Of course on sand if there is much straw it is better to use disc implements and work the straw in. Some farmers contend that the straw ploughed into the land has a tendency to encourage takeall, but my experience has been that land that has been cleaned up preparatory to fallowing has suffered more from takeall than land on which I have disked in a heavy crop of straw and rubbish. In conclusion I might sum up the whole matter with these few words—Fallow early, work firm while the land is wet, keep it clean of weeds, but do not work the land dry if it can be avoided." Mr. Hacket (chairman) agreed with the ideas of the writer of the paper regarding clay land. Mr. Stone did not believe in using a skim plough for fallowing; a heavy disc or mouldboard implement was better. The light skim plough could then be used for working over.

PORT PIRIE (Average annual rainfall, 13·21in.).

March 7th.—Present: nine members and one visitor.

BEST WHEAT FOR DISTRICT.—Mr. D. L. McEwin read a paper as follows:—" The most profitable wheats for our lands have been those raised in our own district. We have had numbers of wheats from other parts, but their life in most cases has only been two or three years. As this is an early district it is almost necessary to grow early wheats. Late wheats are likely to suffer from hot winds unless we get suitable weather in September and October. Then the late varieties will yield more heavily, as most late wheats are heavier yielders than the early varieties. Over an average of years in this district early varieties will take the lead. This has been my experience in light soils, but as the soil varies it may not be general. For instance, the land near the hills is much heavier and should retain the moisture longer, therefore a later wheat may do better. I have tried quite 20 varieties, but keep only to two, namely, Gluyas Early and Carmichael's Eclipse. Those tried include Purple Straw, Red Straw, Bluey, Tuscan, Yandilla King, Federation, Nhill Lotts or Penny wheat, Steinweidel, Petatz Surprise, Marshall's No. 3, African Baart No. 1, Viking, King's Early, King's Red, Baroota Wonder, Ward's Prolific, and Budd's. The last three are raised locally. They have given good service, but are now out of date. King's Early and King's Red make nice hay, but I never had much success with them for grain. Some farmers object to Gluyas and Carmichael's for hay. I own they are not the best, but if they are not allowed to get too ripe before cutting stock will do well on them. I prefer Gluyas for hay for feeding as well as marketing, as it weighs well; but for grain I prefer Carmichael's, especially on fallow. Best results have been secured by sowing Carmichael's first and finishing with Gluyas, as Gluyas sown early is likely to become spindly, and is also more liable to black rust. Gluyas does better on stubble. It needs to be sown thicker, about 1bush. to the acre; while Carmichael's will give good results with about 45lbs., as it is a smaller grain and stools better. If the seed is pickled I would advise sowing thicker. I am inclined to think these two wheats are deteriorating. Some enterprising farmer should hand-select them. Careful grading may keep up a good variety, but it will not be so pure as hand-selected seed."

REDHILL (Average annual rainfall, 16·79in.)

March 10th.—Present: eight members and one visitor.

Construction of Farm Buildings.—Mr. C. H. Lines contributed a paper on this subject, in which he stated that on a new farm it was necessary to build the homestead and stables close to the water supply. The young farmer was usually a man of limited means and could not lay out too much capital in the one building. Plans should therefore be carefully prepared, so that when additions and improvements were being made it would not be necessary to pull down the old buildings. He advised the construction of a two-storied stable to accommodate eight horses. It should be four posts deep, the two centre rows being the same height. He would use the upper floor for a chaffhouse. He preferred 5in. x 5in. jarrah posts for the stable, and the width of the spans should be 10ft., which would allow of 5ft. stalls. The height of the centre posts should be 8ft. and the depth between the centre rows 10ft., which would provide space for the manger. It was necessary to leave a space of, say, 6ft. in front of the manger and 6ft. behind the horses, making the total width 22ft. and the length 40ft. All edges of timber against which the horses were likely to knock should be trimmed. The chaff should be fed to the mangers by chutes, two horses being fed through each. The length of the chaffhouse would be approximately 30ft., height in front 8ft., and at the rear 7ft. By placing the chaffhouse and stable under the one roof a saving in cost was effected. This building appeared to be more suitable for a man with capital, but it was really cheaper for the small farmer, and certainly more convenient. In the implement shed the place for the wagon should have enough height and width to allow the frame to be hung over it. This made it easier to put it on or to take it off. The implement shed and barn should be placed so that it would provide a breakwind for the stable. All buildings should be of wood and iron. Mr. Steele did not favor the erection of two-storied stables, and Mr. Button did not approve of building the barn on the end of the stable owing to the danger of fire. Mr. McAvaney approved of two-storied stables, but would not place the implement shed adjacent to it. In front of every stable there should be a small paddock of three or four acres, with a straw stack. Mr. Pengilly preferred a straw-thatched roof for both stables and implement sheds, as it was much cooler in summer.

The Kitchen Garden.—A paper on this subject, written by Mr. H. Curtis, of the Uraidla and Summertown Branch, was read by the Hon. Secretary. The writer considered that it was essential for gardeners to have their own nurseries, as they were much handicapped when unable to raise their own seed. The seeds should, if possible, be set with early rains in order to produce strong reliable plants. He recommended sowing cabbages, cauliflowers, and lettuces in rows 3in. apart and ½in. in the ground, but on small plots he would broadcast the seed. The surface should not be raked, but covered to a depth of ½in. with clean stable manure. The land should be watered before the seeds were planted, and every day until the plants were strong. Beds should be protected from the ravages of birds with wire netting fastened to frames. Plants raised from seed beds could be taken out of the beds as required. They should be watered well before transplanting, and this should be done on a cool day or in the evening, the roots being kept straight. The Redhill district was not suitable for root crops. He recommended growing turnips or swedes of the Red King variety, and the ground should be prepared to present a fine surface. The seed should be put in to a depth of ½in. with 6in. between the rows and thinned to keep the plants 5in. apart in the rows. Carrots should be planted similarly to turnips. He would not grow parsnips. Peas of the Yorkshire Hero variety were very reliable, and should be planted in rows 2ft. apart and 2in. or 3in. deep. In open country subject to frosts and winds the peas should be protected by two rows of broad beans planted round the beds. Beans should be planted in the same manner as peas; both should be put in in April, when the soil was in a moist condition. He recommended growing a few roots of rhubarb of Burdett's Perpetual variety. The soil should be 10in. deep and well worked, and the plants or crowns set 2ft. apart in and out of rows. They should be covered with 3in. of stable manure and planted in

June or July. Radishes of the Turnip and Chinese Red or White varieties did very well on land that had been well worked for a number of years. The varieties mentioned should be grown through the winter and spring months. Silver beetroot was also a useful vegetable. As each variety of vegetable ceased yielding it should be seen that the land was kept free from stumps of cabbages, &c., to prevent the garden becoming infested with blight, caterpillars, riddlers, &c. If the land were worked up and planted with summer vegetables it could be kept clean and would also bring in a profit. For this he recommended Round Red tomatoes, Turk's cap, or pumpkins. The soil should be worked and covered with stable manure. No summer plants should be sown on the surface, but in drills or round holes. They should not be watered in the heat of the day. Where summer vegetables were not grown a new plot should be selected for the kitchen garden every three years. He would not use manure except in winter months, when the rainfall was assured. Two ounces of sulphate of ammonia should be dissolved in a gallon of water and applied near the roots of the vegetables, care being taken not to touch the leaf, if the land were suffering from the effect of frost. This would add flavor and quality to the vegetables. A few roots of parsley were also of value. In the discussion which followed Mr. Potts considered the Snowball variety of tomato the best. He would run the water to the plants in drains in lieu of using sprinklers.

WHYTE-YARCOWIE (Average annual rainfall, 13·91in.).

March 20th.—Present: 15 members.

Sparrows, Starlings, and Grasshoppers.—Mr. G. A. Wittwer contributed a paper. Whilst the majority of Australian farmers regarded sparrows and starlings as nuisances in the wheatfields and gardens, he said, they overlooked the fact that these birds kept the grasshoppers in check, and so prevented greater damage. The number of other insectivorous birds, such as tomtits, larks, magpies, &c., was kept low owing to poisoning, but the sparrows were too wily to take the baits. He did not think it necessary to protect sparrows and starlings except north of the Burra, where the practice of paying for the eggs at district council offices should cease. Since the advent of the sparrow, he said, no grasshopper plagues had been experienced in the country south of the Burra. Mr. F. Mitchell agreed that birds were great insect destroyers, and supported the idea of district councils discontinuing the practice of paying for heads and eggs, at all events in the northern districts. Mr. G. W. Mudge had seen the sparrows and starlings at work, and agreed with the writer that they were responsible for the deaths of numbers of grasshoppers. He, however, gave greatest credit to a species of bluebird, which came in large flocks and destroyed myriads of grasshoppers during the early summer. The Hon. Secretary (Mr. E. J. Pearce) drew members' attention to an article in the *Adelaide Stock and Station Journal* of November 26th, 1913, pp. 23, on the economic value of our birds, which emphasised the value of birds as allies of the cultivator of the soil. Nature had a way of her own of dealing with her problems, and man with his partial knowledge often did more harm than good. In no case was this more apparent than when he set out on a campaign of promiscuous destruction of what he calls "pests." No observant person could fail to notice the diminution in the numbers of our native birds, and there could be little doubt that this was largely accounted for by the wholesale poisoning with phosphorus and other means for the destruction of rabbits. We were faced with the blowfly pest on sheep and the botfly on horses, pests that were unheard of a few years ago, and which were infinitely harder to cope with than the rabbit, which had some commercial value. It would probably be a practical proposition to sparrow net our small gardens, which would be far more effective than killing the birds in the most wholesale fashion. The Chairman (Mr. G. F. Jenkins) said he considered his vines this year would have, in the absence of birds, given him a return of 40 cases of fruit. He had been able to secure two cases only. He admitted the value of birds as insect destroyers, but it was necessary to keep all these potential pests in check.

WIRRABARA (Average annual rainfall, 18·91in.).

March 14th.—Present: 20 members.

Chaff-Cutting.—Mr. C. Hollitt contributed a paper on this subject. Hay for chaff should be taken from the stack the night before, and damped with water so that it would cut easily, he said. He damped the hay on a floor 6yds. by 5yds., laying it out in rows, so that it could be easily handed to the man feeding the chaffcutter. At this time of the year he would put 5galls. of water on each layer of hay. It could then be put in bags or run back into the shed. The rollers should be so arranged that the teeth did not run parallel, but dovetailed. The top and bottom rollers should run as close to each other as possible; they were then less likely to choke. He preferred needle points to chisel points on the rollers, because if the hay were dry and brittle they would not cut or splinter it. The knives should be kept sharp, and the mouthpiece in good order. Of the three lengths on a chaffcutter, he preferred the middle one. The elevator should have a dust screen or sieve underneath it to let out all dust that might be in the chaff. A screw bagger was of great advantage when any quantity of chaff was being cut. One member mentioned a safety attachment for chaffcutters which prevented men getting their fingers into the knives.

YONGALA VALE (Average annual rainfall, 13in. to 14in.)

March 5th.—Present: nine members and two visitors.

Bulk-Handling of Wheat.—Mr. I'Anson read a paper. If the system of bulk handling were adopted, he said, they could not expect the millers to pay as high a price for the grain and pay 8s. per dozen for bags for flour, pollard, and bran. Whilst the farmer sold the bag to the miller for 1½d., who sold it for 6d., which showed a net profit of 1½d. per bushel on the wheat; this fact was taken into consideration when the price was being fixed. The high price of jute, he thought, would result in increased production, which would be followed by a fall in the price of cornsacks.

PORT BROUGHTON, March 13th.—Mr. Whittaker outlined a scheme for co-operative experimental farms under Government supervision. The Hon. Secretary (Mr. J. H. Fletcher) read a paper on "Seeding." Both matters were referred to the Conference of Yorke's Peninsula Branches for consideration.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16·46in.).

March 14th.—Present: 15 members and three visitors.

Fodder Grasses.—The following paper was read by Mr. E. C. Deland:—"There is no doubt that in many countries the idea of only cropping the land periodically for wheat, without trying to grow grasses and other fodder plants in between times would be considered a rather wasteful procedure, but perhaps our greatest difficulty lies in the securing of suitable grasses that will stand the extremes of frost and heat at a time of the year when water is scarce, or where it is not available for irrigation purposes. Probably foremost of all fodders as far as nutriment is concerned is lucerne or alfalfa. Once established it stands any amount of knocking about, in fact the more the head of the plant is divided the better it grows. It should never be placed in the ground with the drill or deeply harrowed in. The best way of sowing it is to broadcast after mixing it with sand or even with ashes, and then drag light boughs over the surface. The ground requires to be worked down to a fine tilth first. Another method is to run the seed mixed with clean sand and manure through the drill without letting the points go into the ground, then covering the same as before. Once the roots are established they will last for a number of years, and it is astonishing the quantity of vegetation that will result. Lucerne does best in this part of South Australia if sown in the early part of the season; it then has a good chance to become well established before the heavy rains come on and before the frosts get severe. Lucerne grown in this way is not hurt by cultivation and will hold its own even when it is necessary to fallow and crop the land for wheat. It can be fed off several times in a season, and when in the hay field it vastly improves the hay. It does not stand continuous feeding off for any length of time. Grown in a plot of four or five acres or less, so that it can be mown at regular periods it forms a great help to the milk cows, and is extremely useful as a change from the dry feed for the other stock, and if it can be watered even by slightly brackish water several cuts can be taken off each season. There is no other fodder which responds so quickly to watering, and it will grow to a height of 2ft. or over in the clayey or loamy soil of these plains. It does not appear to do too well in the sandy soil, because the head of the plant becomes too deeply embedded by the accumulation of sand around and over the plant, but in damp seasons if sown on the surface in the stubble it will probably get a good hold in the ground. Other good grasses are now obtainable, and amongst the best are Giant Italian rye grass, Rhodes grass, and cocksfoot. These grasses mostly grow in tufts and give astonishing results in soil suitable for their requirements. Some of them stand the heat well and help to bind the soil if loose, but not many of them stand cultivation in the open field, as they are not deep rooted like lucerne. Grown in specially prepared plots, and sown on the surface and covered in with a bough brush they form a great standby in the summer months, but no grass has been found yet that will stand season after season the cultivation necessary to the land for wheat growing, with the exception of lucerne. Rape, vetches, and peas are all good fodder crops, and especially for sheep, but they only last the one season. On the other hand they are of great advantage in gathering nitrogen into the soil. They all do well in this district, but the seed must not be sown too deep. For binding the sandhills the ordinary couch grass or Kentucky Blue grass seem to be about the best. The roots and runners spread long distances under the surface, and although cultivation kills some of the grass it bears considerable quantities of seed, which comes up in the following season. The roots and runners, when buried in the sand, help very materially to bind it, and also to gradually enrich it in humus. I believe if these grasses were tried on the sandhills of this district in the damp seasons they would get a good hold and be of great advantage eventually. While they are not quite equal to the grasses previously mentioned as fodder, they are readily eaten by the stock in the dry part of the year. Like all these fine seeds, care is required in the sowing, as they must not be buried to any depth, but should be just under the surface. The seed is very light, hence the need of sowing when the weather is favorable and a good rain likely to fall almost immediately. In the foregoing I have not dealt with such fodders as holcus, sorghum, maize, soya beans, &c., because they all require special cultivation, and are more suitable for climates like we have in the hills, although a fine plot of maize has been grown this season close to the town without much artificial watering. This is a most opportune time to cultivate some of these grasses. The advantages to be gained are so many, particularly the introduction of more humus and nitrogen into the soil, and the provision of green feed for fattening lambs and sheep, and as a tonic for larger stock during the dry summer months."

JULIA (Average annual rainfall, 18in. to 19in.).

January 10th.—Present: 10 members and two visitors.

Stripper *v.* Harvester.—Mr. J. Jaffer read the following paper:—"Advocates of the harvester maintain that such machines gather more wheat per acre under similar conditions and crop, are less liable to choke in the comb, and are enabled to start earlier in the day to strip to satisfaction than the stripper. However, since from the points of the comb to the outlet of the thrasher harvesters and damp-thrasher strippers are identical, all arguments in this direction must be recognised as idle. It is also contended that more wheat is obtained through the heads constantly being circulated through the thrashers of the harvester. If the machine cannot sufficiently treat its passing products in the one rotation, sooner or later elevator passages or sieves must get blocked or choked. Giving the harvester as a mechanical production its dues as being sufficiently improved to treat its passing products in one operation, such choking up of elevators, with careful control, may seldom occur; but it must be admitted that mechanical ingenuity in this direction is not lacking in damp-weather strippers and power winnowers, whilst these, even under poor control, still give good results. A further argument which is brought forward and which, without forethought, appeals strongly to users of harvesters is the saving of labor, and getting through early with harvesting operations. Yet, since three men are able to manipulate any power winnower, it must thus be recognised that any farmer or producer employing three or more hands during the harvesting season would be well advised in using strippers and winnowers, since the same work under this system can be done by less experienced men with less horse power, and completed in less time, with more comfort and ease, thereby ensuring a better sample and gaining many other advantages. Farmers in a smaller way are using their petrol engines to drive hand winnowers, thus saving the labor of an extra man, and thereby also gaining every other advantage such mode of harvesting affords. Strippers are built as wide in the comb as harvesters. Whilst four horses are required in the harvester, three only are needed in the stripper. From the foregoing we can conceive no advantage the harvester may claim over the stripper; but numerous are the advantages in the reverse direction. We have heard that the initial cost of each mode of harvesting is similar, but strippers and winnowers have lasted in many instances over 30 years. What is the life of a harvester and the cost of upkeep in proportion to the other machines? Any intelligent boy can handle a stripper to perfection, whilst it takes an experienced man to manage a harvester. It is generally recognised that hilly, sandy, rough, and stumpy country is practically unsuitable for harvesters to give favorable results, and although the winnower portion on them is made to be regulated forward and backward, there is only one sideway adjustment, and when harvesting along the side of an incline it must naturally heap the crop to be cleaned on to one part of the sieves, whilst over the other parts it is scantily spread, the result being an uncleaned sample or waste of wheat. Similar results are experienced in turning corners, stopping, or starting, whilst winnowing sieves are in full speed. It is owing to these difficulties that at harvester trials the man in charge will keep his machine moving straight ahead until the sieves are cleared of all material under treatment, and only then turning to enter the crops on the opposite side, thus only stripping two sides of the plot at each round and never turning short to strip the ends. A further loss of grain attributed to the use of harvesters is whilst letting the wheat from the box into the bags. One must be again more than careful whilst taking off or dumping and sewing up bags. This also occurs in the ordinary way of winnowing wheat, but spilt grain is afterwards easily collected. However carefully the harvester is handled, it affords every opportunity of losing grain, whereas under the other mode of harvesting, even with careless management, every grain passing the thrasher outlet of the stripper into the box is saved and well stored. Placing bags of wheat all over the field has not only been recognised by many as an inconvenience in sewing and in loading afterwards, but it is also exposing the bagged wheat in case of fire or wet weather. The gathering of chaff with harvesters has proved itself a failure. This by-product has in times gone by been valued at 6d. per bag, and even within the last six months it has again proved its worth. Another by-product lost through the use of harvesters is the screenings. Some is collected in the box, but most of it is blown to waste with the chaff. With the stripper a crop can frequently be stripped long before a harvester can be put to work in the same field. The results of harvester-stripped green patches or irregular ripening grain are too well known to need further comment. With strippers the grain is left to ripen in the heaps amongst the chaff. Star thistles and other foreign matter is dried up there, and afterwards in winnowing it easily passes out with the chaff, whilst with the harvester thistle seeds, sheepweed seeds, backbones, &c., pass through into the wheat. Another undoubted advantage the stripper gains over the harvester is the collecting of obnoxious weed seeds. These the harvester scatters over the fields, and some who have had harvesters have a woeful tale to tell in respect to this trouble. There are many farmers of to-day who have given the harvester a fair trial who have since taken to strippers again, some putting their harvesters to use as stationary power winnowers."

JULIA (Average annual rainfall, 18in. to 19in.)

February 7th.—Present: 14 members and three visitors.

Storing Wheat.—Mr H. Pfitzner read a paper. He said—"One of the greatest mistakes that Australian farmers make is that of not storing wheat in their own barns until they wish to sell it. If they did so they should be able to obtain anything from 2d. to 6d. per bushel on an average more than they obtain under the present system. Stored wheat is practically always on the market and against a man when he wishes to sell. Wheat kept for about seven months will gain about 7lbs. or 8lbs. per bag in weight, and that means about another 2d. per bushel. If it is well stacked the mice will do very little harm. If wheat were carted later, say in the winter, the roads would not cut up so much, because such big loads would not be taken."

Cleaning and Marketing Wheat.—Mr. R. W. Rowett read a paper, in which he advised cleaning wheat for sale or for seed. The screenings were very useful on the farm for feeding poultry and pigs. The paper continued—"All farmers should have a grader, or otherwise have their wheat graded for seed, as I am strongly in favor of a good large and plump grain being sown. The wheat plant takes its first food from the grain, and therefore a much stronger and healthier plant must be produced than from a shrivelled grain. Farmers are well advised to dispose of as much of their grain at harvest time as will pay their way. There is little to be gained by holding wheat and having interest to pay; but the farmer who has wheat with which to trade should store it in his own barn."

MALLALA (Average annual rainfall, 16·88in.)

March 2nd.—Present: 12 members and three visitors.

Continuous Cropping.—Mr. Oliver gave the following particulars regarding six acres of land which he had cropped continuously for seven years. In 1907 it was drilled with King's Early, with 50lbs. super. per acre, and it yielded 1½ tons per acre. This crop was exceptionally early, being bound on September 20th. In 1908 oats were sown, with 60lbs. super., and returned 3 tons of hay per acre. In 1909 English malting barley, with 70lbs. super., was sown. It reaped 30bush. per acre. During 1910 King's Early was again sown, with 1cwt. super. It cut 2 tons hay per acre. In 1911 oats were sown, with 1cwt. super; 48bush. per acre were secured. Baroota Wonder was sown in 1912, with 1½cwt. super. It started very late but cut 15cwts. per acre. In 1913 four and three-quarter acres were sown with peas, which grew a very nice crop; one and a quarter acres were sown with barley, with 100lbs. super. On the 1st August this grew a very thick and strong plant; three horses were grazed on this piece for a month. He took them out on the 20th October. A good rain fell shortly afterwards and the crop yielded six bags from the one and a quarter acres.

Engines on the Farm.—Mr. W. H. Tomby read a paper. He said, "The engine can be utilised on the farm in many ways, such as for chaff-cutting, sawing firewood, winnowing, and crushing. The portable oil and petrol engines (6 h.p. or 8 h.p.) are the most suitable for farm purposes. With the stationary engine there is hardly any vibration compared with the portable type. I prefer the oil engine. The cost is much greater at first, but better value is secured. Benzine used by the petrol engine costs at the lowest 1s. 8½d. per gallon, whilst kerosene costs 7d. per gallon. To do the same work the petrol engine takes nearly as much fuel as the oil engine of the same power. The advantage with the oil engine is that there is no magneto or spark coils. To a man who does not understand electricity this ignition is very puzzling when anything goes wrong. Then again the speed needs some consideration. The average speed of a 6 h.p. oil engine would not be more than 300 revolutions, while a petrol engine of the same horsepower would make 400 to 500 revolutions per minute. Some favor the petrol engine because it can be started at a moment's notice; but, if the lamp is lit first whilst the cutter is being sharpened and oiled, the oil engine will have become hot enough for starting. Use high-grade oils or the engine will lose power and the rings around the cylinder will wear. The engine should be well looked after and have a good overhauling once a year. All of the bearings should be well cleaned with kerosene. The valves, especially the exhaust, should be taken out and cleaned occasionally."

NORTHFIELD (Average annual rainfall, 19in.).

March 3rd.—Present: seven members.

Farming in Scotland.—An interesting paper was read by Mr. A. Low. He referred more particularly to Aberdeenshire, and said it was difficult to get a farm in Scotland. There was no land board to whom one might apply, with the almost certain chance of at some time securing a farm; but instead a person had to wait until someone died, was evicted, or left to go to fairer climates. Then perhaps there might be 20 or more persons wanting the same piece of land. The owner usually, although not always, let it to the one that made him the best offer. The rent ranged round 20s. per acre, the first payment being made 18 months after taking possession. The system of farming practised was what was generally known as the five to seven shift system or rotation of crops. If the farm consisted of, say, 350 acres there would be 100 acres in pasture land of second or third year grasses, 150 acres in oats or barley or a small portion of green feed, 50 acres in hay or first year's grass, and say 50 acres of turnips. The manuring was a most expensive item. First for oats, say, 1½cwts. to 3cwts. superphosphates, bonedust, or potash; then after a few weeks, 30lbs. to 40lbs. of nitrate of soda, &c. Six bushels of seed were sown to the acre, and in the case of barley, 3½bush. Turnips, which was the most costly crop to produce was fed off with sheep or cattle.

RIVERTON (Average annual rainfall, 20.48in.).

February 24th.—Present: 17 members.

Wheat.—An interesting address on this subject was delivered by the Hon. W. Hannaford, M.L.C. He mentioned that so far as this State was concerned, the consumer called the tune as to price, and it was only as we were able to compete in production with other countries that our industry would exist. Since the use of superphosphate had become general, this State was able to produce grain in areas that were previously outside the margin of profitable cultivation; also, the best lands yielded more per acre, thus reducing the cost of production of the wheat. With the increase in the value of livestock he thought it might pay producers to co-operately purchase machinery and thresh some of their grain in order that they might retain more of the fodder value of the straw. There was a tendency for the farms to become somewhat dirty, and he strongly advised the grading of seed and feeding inferior grain to stock on the farm. Out-of-date machinery should not be countenanced. The question of bulk handling of wheat was awakening considerable interest in Australia. The fact that the price of jute had increased, and that the present sack held only 3bush. as compared with the 4bush. held by the old type of bags, was largely responsible for this. To introduce the bulk system meant a reversal of present methods from the farm to the port of anchorage. This system would in all probability be initiated in Victoria and New South Wales, where the railway system and shipping conditions were far more favorable to its inception. South Australian conditions were very different, and it was questionable whether the change would offer any advantages. Under present selling methods the farmer secured full value for the wheat which he sold, the merchant taking the risk of his agents' judgment. The farmer was paid immediately, or, if he desired to store in anticipation of a higher price, the merchant took all risk of damage by rain or vermin. In New South Wales the Government erected sheds in which the farmer could store his grain. He took all risk of damage through weevil or mice. It was problematical, however, whether his storage charges did not amount to more than he would have to pay a merchant for the redelivery of his wheat. The risk of the failure of the firm which held the grain was the only one, and the experience of the past did not point to this as being very great. In Victoria and New South Wales the trade was concentrated to one or two centres. Practically all the wheat of New South Wales was sent from Darling Harbor, and from Williamstown and Geelong in Victoria, so that the building of the necessary sheds would not dislocate the point of shipment; but if, in South Australia, we had to bring all the wheat to Port Adelaide and one additional port, we would find that the transit would be so heavy that the resulting advantage of bulk shipment would be more than mopped up by the increased cost. We had about 15 deep-sea ports for oversea shipments where even the convenience of jetties was not provided, the ketches simply lying on the beach and the farmers carting the wheat to them in their wagons. Possibly under conditions like those of Victoria and New South Wales the bulk system might be worked to advantage, but South Australia could afford to allow these States to take the initiative. If it were necessary to use bags for part of the journey from producer to consumer, these bags would be unfit for further use. It was more profitable to minimise leakages under direct control. Everything saved or conducted more economically would result in a greater profit than railing against high cost of cornsacks, unless we could see a more satisfactory method of dealing with the produce. The cost entailed every year in bags would eventually bring about some method to counteract the extra cost. Weighing by means of the bridge, and machinery for handling the bags of wheat from truck to ship's hold, the reduction of railway grades to enable the railways to take bigger trains, and the overlapping of agents, &c., left avenues still open for exploitation.

BALAKLAVA, March 18th.—Manures.—A discussion was initiated by the reading of an article dealing with the use of basic slag, and the heavier manuring of wheat lands. Several members expressed the opinion that it would soon be necessary to use something besides superphosphate on the land, although some had not had satisfactory experience with the use of basic slag some years ago.

CLARE, March 13th.—Explosives.—A short address on this subject was given by Mr. E. L. Elliott.

Pruning Match.—It was decided to hold a pruning match, and the following committee was appointed to superintend arrangements:—Messrs. W. Patullo, J. H. Knappstein, C. S. Jarman, R. Hunter, M. L. Nolan, F. W. H. Lee, J. Berridge, and P. H. Knappstein.

WATERVALE, March 9th.—Crops.—Members reported a fair crop of currants of good even sample; bucks were very prevalent. There was a very heavy crop of apples, but the quality was not up to the usual standard, owing to the dryness of the season. There was little summer feed in the district, for the same reason.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

MAITLAND (Average annual rainfall, 20·08in.)

March 7th.—Present: nine members.

Papers for the Branch.—In a paper dealing with this subject Mr. H. Bawden said that some members appeared to think that because they had not received a good education they should not write papers for the Bureau. This was a mistake. A fine literary effort was not required, but practical information, founded on experience, of matters of agricultural practice.

Harvest Results.—Mr. Wundersitz attributed the partial failure of the last season's crop to the prevalence of rust, hot weather in September, and frost. Other members expressed various opinions on the cause. Mr. Bently thought the best wheats for the district were Yandilla King, Federation, and Marshall No. 3; Mr. Jarrett favored Marshall's No. 3, Yandilla King, and King's Early; Mr. Wundersitz Marshall's Early Pearl, Marshall's No. 3, and Yandilla King; Mr. Heileman Federation, Silver King, and Bluey; Mr. Hill Silver King, Marshall's No. 3, and King's Early; Mr. Smith Marshall's No. 3, Silver King, and Federation; and the Hon. Secretary (Mr. C. Pitcher) Marshall's No. 3, Yandilla King, and King's Early.

PINE FOREST (Average annual rainfall, 14·15in.)

March 10th.—Present: seven members.

Grading Seed.—Mr. S. T. Barr read the following paper:—"In selecting seed wheat it is necessary to obtain the varieties best suited to local conditions. Two varieties of wheat grown side by side, put in under exactly the same conditions, will vary in yield as much as 6bush. to the acre. Having got the varieties which suit the district best, the preparation of those wheats for seed is something that should secure best attention. For this work I consider the seed-grader indispensable on the farm, for, by the careful use of this machine not only are all the weed seeds removed, but the cracked and smaller grains are taken out, thus leaving a nice even sample of wheat. Some say they can put 50 or 60 bags a day through the grader. If the wheat is a good sample, free from weed seeds, and only containing chaff and long straws, this may be possible; but when drake, sheepweed, nannyweed, wild oats, and other weeds have to be taken out, as is sometimes the case no matter how careful we are, it is necessary to put it through the machine steadily, and I consider 30 bags a day quite fast enough. The value of sowing well-graded seed has been demonstrated beyond dispute, as much as 2bush. and 3bush. to the acre being shown in favor of the graded seed. If we improve the yield of our crops to the extent of 1bush. to the acre, it is well worth our while; and if 2bush. or 3bush. to the acre are added the extra time spent on grading will be a paying proposition. The scheme as laid down by Mr. A. E. V. Richardson (once Acting Director of Agriculture in this State) would be a good one for us to adopt. That is, go through the wheats we intend to save for seed just before harvest time, pick out enough of the best of the heads to make 10lbs. of seed, sow this with the drill in one long strip of one-fifth of an acre. The following harvest go through this strip, again picking out the best of the heads, then reap the rest of it for a seed plot. By the third year enough should be obtained to sow 100 acres. To be successful this has to be kept up, the 10lbs. of picked seed representing the stud wheat plot each year. By this means the yield should be materially increased and the tendency to degeneration checked. This scheme would also be the means of getting rid of the barley from our wheats, which is becoming far too prevalent in some of the varieties; or failing this we could have, say, a five-acre plot, and when the barley comes out in ear pull the plants up by hand. With late wheats this is an easy matter, as the barley comes in ear first; but the early varieties of wheat are in ear before the barley, and with bearded wheats the barley is difficult to see. Our best plan then would be, after having graded the seed with the machine, to handpick a bushel of it. Sow this on an acre of ground. The following year we would have enough to sow 15 acres. To keep our wheat free from smut we must pickle the seed; a 1 per cent. to 1½ per cent. solution of bluestone is strong enough for this. Although the wheat can be sown a day or two after pickling, I believe it would be advisable for us to pickle some weeks beforehand; at all events the wheat would go through the drill better, and I think the smut would be more effectively destroyed." Members discussed different methods of pickling seed.

WESTERN DISTRICT.

COORABIE (Average annual rainfall, 11in. to 12in.)

March 7th.—Present: 12 members and two visitors.

Poultry on the Farm.—Mr. E. J. Stretton read a paper on this subject, from which the following is taken:—"There is a common impression that the production of eggs will soon be greater than the demand. This is a mistake, according to statistics. I would impress on everyone the necessity for making a start in poultry-keeping, not as an industry in itself, but as a side line on the farm. That there is money in the business I am convinced from my own experience, and from the point of view of profit I prefer a few good hens to a pig on the farm. I advise the purchase of a dozen or so White Leghorns, This breed is a layer purely and simply, and although on the small side it makes up for this by its hardiness in a dry climate like our own Other breeds are better meat producers and fair layers, but they cannot compare with the Leghorn for laying, and that is where the money comes in in a district where there is no market for the table birds. Erect an iron shed sufficiently large to accommodate the number of birds to be kept. Have the shed enclosed except at the front, and near to a large shady tree, in order to keep the birds as cool as possible in the hot weather. Place the perches not higher than 4ft. at the back. Keep the shed clean and give the whole building a good coat of whitewash frequently. This will keep the birds cool and free from vermin. Give them whole grain morning and evening at regular hours. Scatter it in clean loose soil or in a heap of straw to give the birds exercise. Cultivate a small plot of lucerne, rape, or kale, as a little greenstuff is a wonderful tonic and constitution builder. A little scrap meat minced up and mixed into bran mash occasionally in the winter mornings will keep up the egg production. During the hot months keep the water supply cool and clean. On very hot days throw a bucketful of water down in a clean patch of soft soil in a shady spot. The birds will bask in it as long as it is moist. Do not overfeed; give them just enough to keep them busy scratching for a few minutes. Sick hens should be immediately killed and burned. Delay in this matter is running the risk of further infection and heavy losses. Breed only from the best stock, and hatch out the chicks with a good barn-door hen. Choose the eggs from the best hens, and for the best results pick out the natural shaped egg. Eggs for the market should be infertile, as they keep best." Mr. Atkins mentioned that he had experienced no trouble in growing lucerne and rape without irrigation.

KOPPIO (Average annual rainfall, 22·40in.)

March 12th.—Present: nine members and one visitor.

Experiments on the Farm.—The Hon. Secretary (Mr. R. F. Richardson) read the following paper:—"It seems that we, as farmers, are apt to regard experimental work as something rather beyond us; something which must be left to the agricultural colleges, experimental farms, and a few enthusiasts. We read with interest of the work done and the results arrived at by these institutions and enthusiasts, and probably profit by them to a slight extent; but it is doubtful if any of us derive the full benefit from them, because we fail to follow them up. The fact that is lost sight of is that a few properly conducted experiments greatly lessen the risk of failure and enable the farmer to increase his yields. The plea 'want of time' is often put forward, with the result that experience is dearly bought. As a matter of fact experimental work should be classed with the current work on the farm. Conditions vary so much that what would apply in one part of the State would be practically useless in another, and in this particular district especially, which is situated so far from any experimental farms, systematic experimental work is almost essential. Further, in this district there is a wide field for such work, for besides cereal crops almost every farmer breeds sheep, and the abundant rainfall enables almost any fodder crop to be grown, and fruit trees of most varieties thrive remarkably well; but it would be a mistake to undertake more than could be carried out with thoroughness; for unless an experiment is accurately conducted the result loses much of its value. In my opinion experimental work should be one of the chief features of the Bureau." Members agreed that a systematic series of experiments would be of much value to farmers in the district. It was decided to conduct experimental plots. Messrs. G. B. Gardner, F. Richardson, and J. Newell were appointed a committee to supervise. Mr. J. Newell agreed to continue the manure tests which he had started last year, and Mr. Gardner undertook to conduct plots to test varieties of wheat on his farm.

MILTALIE (average annual rainfall, 14·55in.).

March 7th.—Present: nine members and three visitors.

Cultivating and Seeding.—Mr. M. H. Wilson read a paper. He said—"Fallowing, in my opinion, is essential in any class of soil to produce in average years a decent crop. Of course in the fat years on new land good crops are grown, but where there are weeds and the land is old, it would be more luck than good management to get a good crop by just ploughing the land in front of the drill. The land should be fallowed about 4in. deep, and cultivated to a depth of 2in. once before harvest at least, and again immediately after the early rains. When seeding time came a very light implement would be quite sufficient. The land should be harrowed crosswise after each working. The mallee shoots should be cut every year whether the land is in crop or not, especially on fallow, as they extract a lot of moisture. I do not believe in dry ploughing, as it encourages takeall, and does little good to compensate for the risk of that pest. Where cultivating is impracticable, sheep are a good substitute for keeping the weeds down. In a young district like this there are many difficulties which arise to make fallowing on a large up-to-date scale wellnigh impossible, such as shortage of feed and water. When the farmer has to cart the latter long distances, as many have, it takes all his time and strength. A good substitute for fallow is to plough the land immediately after the summer rains. By the time the stumps are disposed of it is time to commence seeding operations, and the land is ready to cultivate. Faulty implements also play a big part in the average yield. I do not believe in the long skim ploughs—12 furrows or more. To make them light the manufacturer has to make them weak, and the plough twists and strains until one furrow does the work of two. The result is that the land is improperly worked, and that means a decreased yield. A twin plough is a great deal better. The first time the land is ploughed a heavy standard mouldboard implement should be used, except where the land is very sandy. Then a medium plough does just as well. The second week in April is early enough to begin sowing wheat. Oats can, with advantage, be sown a little earlier. The seed should be sown about 2in. deep. It is always a good plan to harrow the land immediately after sowing. After the middle of May it is advisable to sow only early wheats, as then the crop is far enough forward to stand frosts and the strong north winds. If the plant is young the latter succeed before long in entirely blowing it away."

ROBERTS AND VERRAN.

March 10th.—Present: eight members.

Summer Fallowing.—Mr. G. Plew read a paper as follows:—"I would start fallowing as early as possible, say about the middle of February, and work to a depth of at least 3in. I would not put the harrows over the land, as if it is at all hard it will set down, making the working back much harder and less effective. Land fallowed early will grow quite as much, if not more, feed than that left until after seeding. The seeds germinate more readily if the land is broken early, thus retaining moisture that might otherwise run to waste. Summer fallow should be worked directly after seeding is finished, and any other fallowing can be done afterwards. The early fallow will then stand another working if it is at all dirty. Returns from this are better than those from ordinary fallow. The land is kept much cleaner and the crop will stand a dry spell much better if properly worked. If the ground is at all likely to wash or to cake it is advisable to turn in the straw. This helps to keep it loose, and it will be quite damp when other land is very dry." Mr. F. Masters thought summer fallowing impracticable in this district. Members generally agreed that the practice was one that could be profitably carried out in the district, but the time was hardly ripe for its adoption.

UTERA PLAINS (Average annual rainfall, 12·06in.).

March 7th.—Present: eight members.

The Fire Rake.—Mr. W. Gale contributed a paper on this subject, in which he said that the fire rake was very useful in this district, as the straw did not grow thick enough on the sand rises to secure a good burn. It removed the straw and at the same time killed many of the shoots. Some might grow again, but they would not trouble the reapers. It was advisable to burn the straw against the wind. One man had in three days cut all the shoots left on 240 acres, which he burnt in April. Many of the shoots had made no subsequent growth, but in another paddock, where the shoots were cut in July, it took two men four weeks to cut them. This year he fire raked the paddock, and most of the shoots were killed. He had found axle grease better than oil for the wheels of the rake. The rake he used was 15ft. wide, and it was not heavy for two horses. More shoots were killed when working the rake at a steady pace than at a fast rate. Members emphasised the necessity for having high wheels for the rake and the use of axle grease in the place of oil.

YADNARIE (Average annual rainfall, 14·09in.).

February 7th.—Present: 16 members and a large number of visitors.

Water Conservation.—Mr. H. Bauer read a paper on this subject. A water supply was the most important factor in the settlement of new country, he said. For domestic purposes the roof of the homestead would generally supply all the necessary water, except in very dry seasons. Many points were to be considered before deciding on the nature of the supply. The cost of the undertaking had to be taken into account, and whether the necessary time was available to commence a large scheme. It was sometimes advisable to put up with a temporary supply and increase it as opportunities offered. He favored boring, especially in this district, where it had been proved that good stock water existed. A dam did not retain water long in such dry seasons as the present. The water evaporated quickly in scorching hot northerly winds. A site with a good catchment should be selected, and a fairly large dam constructed, say about 30yds. long by 12yds. wide, and from 6ft. to 8ft. deep. It should be long and narrow, so that a roof could easily be erected over it. A light and inexpensive roof could be constructed of wire netting and porcupine bush. The covering checked evaporation, kept the water cool in hot weather, and kept the stock out of it, and thus prevented pollution. A small force pump was a cheap and effective method of raising the water from the dam. Where there was a good claybed, but the catchment area was light and sandy, it was a good plan to spread the clay scooped from the dam upon the steepest slopes, and after a good rain it could be puddled. The surface would soon harden and provide a good run. Often, when a good catchment area was available there was no ground suitable for the construction of a dam, the soil being porous or stony. A tank should be constructed by ploughing the surface and scooping out as much earth as possible. The sides could be cut down with a pick, and a 9in. wall of solid stone well built would be sufficient for 25,000galls. capacity. It should be roofed with wire netting and porcupine bush, which was cheaper than timber and iron, and was quite as effective. He believed that boring would be generally successful on Eyre's Peninsula. It had been stated that stock would live practically twice as long on poor food and a good water supply than they would on an excellent food supply and a scarcity of water. In the discussion which followed, members generally were of the opinion that dams were best where good clay was available, on account of cheapness. Tank walls should be built 2ft. thick. Mr. J. J. Deer favored boring, and thought the Government should test the country to locate water supplies.

COORABIE, January 10th.—The meeting was devoted to a discussion on "Home Remedies for Horse Ailments."

COORABIE, February 13th.—Sixteen members and about 80 visitors spent an enjoyable social evening. Mr. E. J. Stretton contributed a paper on "The Commercial Side of Poultry-keeping on the Farms."

ELBOW HILL, March 7th.—Members discussed the subject of bulk handling of wheat. It was generally agreed that the system would eventually have to be adopted on account of the high price of cornsacks.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BERRI.

January 10th.—Present: 14 members.

Dairying.—Mr. R. Stachling contributed a paper on this subject. This district, he said, was capable of being made into a first-class dairying area. With this object in view they should start from the first with the idea of getting the land into condition for the production of lucerne, maize, sorghum, and millet for summer fodder, and wheat, barley, and rape for early winter feed. Swedes, mangolds, and pumpkins were good milk-producers. Feed could be conserved either as hay or as ensilage. The cattle should be carefully selected, especially in regard to suitability for the district. Cows and a bull from a known milking strain should be procured. A careful record of the yield of each animal should be kept. Testing could be done with a glass tube milk tester or the Babcock tester. The milk should be strained and separated whilst still warm. The cream should be cooled immediately. It should be churned at least twice a week. The general opinion of members was that to make dairying an industry on the river settlements railway transit to the larger centres of population was necessary.

COOMANDOOK (Average annual rainfall, 18·01in.)

March 14th.—Present: nine members.

Scrub Farming.—Mr. H. Gosden read a paper in which he advised the planning of a scrub farm with a definite eye to the future. The homestead should be placed in the centre of the block, and the site should be fenced, four or five acres being enclosed. A narrow break should be allowed to stand on the outside of the homestead fence, and trees should be planted inside; fruits should also be put in. Pigs and poultry should be kept, and efforts directed to the clearing of 100 acres of mallee to provide grazing for sheep and cows. Ten acres should be worked for hay and green feed. Neighbors could combine in the purchase of such machinery as engine, seed grader, binder, &c.

Agents.—Under this heading Mr. L. Crouch read a paper, in which he stated that farmers should purchase implements and machinery direct from the manufacturers, thus doing away with the necessity for agents, and saving commission. The firms could ing the merits of their goods under the notice of farmers by posting them a catalogue e prices annually. Members thought that in the event of agents being dispensed with th prices of machinery would be reduced. It was decided to order requirements direct.

GERANIUM.

March 17th.—Present: 13 members, one visitor, and the Secretary Advisory Board.

Experimental Work.—As this was the first meeting of the Branch since the harvest, several of the members who had conducted some rough tests presented the results to the meeting. *Manures.*—Mr. R. Jacob put in 45 acres of stubble with 1cwt. super. per acre, and from 40 acres of it reaped an average of two bags per acre. On the remaining five acres of this block, however, he applied a top dressing of nitrate of soda at the rate of ½cwt. to the acre, and from the portion so treated reaped three bags to the acre, or approximately a 3bush. increase on the super. only, at an additional cost of 7s. per acre for the nitrate of soda. The land was necessarily put in in a fairly rough state, and with better cultivation he believed the enhanced profit from the direct nitrogenous manure would have been greater. On another plot a mixture of nitrate of soda with basic slag gave no better result than the part manured with the 1cwt. of super. *Peas v. Fallow.*—Mr. Jacob also had a block of fallow adjoining land previously under peas. Lott's wheat was sown on the fallow, and for a few drill widths on the pea land. As the whole was cut for hay he could not give exact returns, but there was a marked difference in the appearance of the crop in favor of the pea ground, where the wheat stood quite 6in. higher than that on the fallow. The pea ground, however, would have had the advantage of any residue of the ½cwt. of super. per acre, which that land had received with the peas. *Potash Manures.*—Mr. W. Pannell had put in an acre of peas, half of it with super., and the balance with super. and about 10lbs. sulphate of potash per acre. The yield was much heavier where the potash had been applied. To test the matter further he had bought this year a ton of phosphatic manure containing in addition 15 per cent. of potash manure. This manure cost about £6 3s. 6d. per ton, but he believed that it would pay. *Takeall.*—In one of Mr. Pannell's paddocks a considerable area of the crop on fallow had been destroyed by takeall, and the stripper was not put into it at all. Part of this fallow, however, had been harrowed once, after a rain at haytime, and on that part a satisfactory yield was reaped. The harrowing of the fallow after rain made all the difference between success and failure in that instance. *Quantity of Super.*—The Chairman (Mr. W. Mitchell) had a big block of Nhill wheat grown from ungraded seed, sown at 60lbs. per acre. The bulk of this was manured with 60lbs. of super. per acre, but on half an acre, carefully measured, 112lbs. of super. per acre was applied. This half-acre and a similar area of the main crop was harvested separately, and the grain weighed. The result was 9bush. per acre from the 60lbs. super. and 11bush. 24lbs. from the 112lbs. super. The balance of the paddock where only 60lbs. super. had been applied, also yielded an average of 9bush. per acre. The extra super., therefore, returned an extra net profit of say, 5s. 10d. per acre. *Rotation of Crops.*—An address on this subject was delivered by Mr. R. Jacob, who at the outset referred to the antiquity of the practice of rotation of crops. Some of the reasons for the practice were that by the growth of a variety of crops greater economy of food supplies was secured, and fertility was better preserved. The land was more continuously producing, greater value being won from its resources. The work of the farm was also more evenly distributed over the year, and there were fewer periods of rush. Some crops were a good preparation for others, the ravages of insect and fungus pests were discouraged, stock were moved more systematically over the farm, and a greater variety of food supplies was raised by the rotation of crops. It was evident that some system of rotation must be evolved for this new country, and it must be kept in view that for a long time to come wheat would be the staple product here. It had been proved that wheat continuously would not pay, neither would wheat and bare fallow only prove to be the best system for these lands. As wheat was the staple product, and takeall the greatest enemy, the growing of oats must be considered in any rotation. A rotation practised successfully in the Nhill district of Victoria was wheat, oats, grass, and fallow. Some varied this to wheat, fallow, oats, grass, fallow, and then again wheat. No leguminous crop was included in that rotation, but probably when left out to grass there would be in that old district an abundance of natural clovers which had not yet appeared in any profusion here. For their value in the fixation of nitrogen, therefore, he would include some leguminous crops here. Although it would be difficult to dispose of the produce from large areas of peas, every farmer should have some in each year, if only 10 acres. Catch crops, such as rape, turnips, &c., must go together with livestock, and were, therefore, out of the question at present. He therefore recommended for the immediate future a rotation of wheat, oats, fallow, with the addition of as large an area as practicable of peas. In the discussion the Chairman said that in view of the absolute necessity for growing oats to check takeall a relatively small area should be sown to this crop every year, instead of continuing with wheat until the bulk of the farm became affected with the takeall fungus, and it became necessary to put such large areas under oats as to render the disposal of the produce a difficult problem.

The best of hay could be cut from the oat crop. Mr. Pannel was convinced that disaster would result from the continuous practice of bare fallow and wheat Mr. Troubridge, of Lameroo, had never averaged less than 12bush. per acre from his farm, and he had always left the land out to grass one year in three, and was now carrying 700 sheep. *General Matters.*—The Secretary of the Advisory Board addressed the meeting on Bureau work generally. He congratulated the members on the work accomplished by the branch, and urged that the experiments being conducted by members should be co-ordinated to prevent undue duplication, and to secure the greatest results from the work. Such tests as those detailed at this meeting reflected credit on the men conducting them, and suggested the lines upon which the Bureau could do its best work for the members and the district. The variety of grasses and fodders seen that day at Mr. Jacob's farm, including perennial rye grass, cocksfoot, Bokara clover, millet, paspalum, and others becoming established under such adverse conditions as those experienced during the past two years, was exceedingly suggestive of the future stock-carrying potentialities of the districts and of avenues of work for the Bureau, which should enable it to contribute materially to the advancement of the district and the State.

LAMEROO (Average annual rainfall, 16·55in.)

February 14th.—Present: 13 members.

Farm Planning.—In dealing with this subject in a paper Mr. A. J. A. Koch said—"Mistakes made at the beginning often cannot be remedied, and it is always worth while to carefully consider before permanent buildings or fences are erected. In many instances the homestead (especially in mallee country where a track has to be cut to gain admittance to a block) springs up around where the first camp is pitched, frequently right in one corner of a big square block, or perhaps in the same position on a triangular farm. When the time involved travelling back and forward is considered, how much is saved by having the centre of operations in the right place? It might be wise from time to time to place in the *Journal of Agriculture* a guide as to how a farm should be planned. A variety could soon be obtained by asking members of the various Branches to send in plans of their own holdings. The best of these could be selected and printed in the *Journal.* With many who are selecting land at the present time—usually young men—want of experience is the great drawback. Older men taking up new country are careful enough to remedy any mistakes they have made before. With a rectangular block one can put a house halfway between the sides and about one-third the distance from one end. Fencing is not hard to plan. A fenced race from the road to the house and from the stable to the top paddocks saves a good deal of time driving horses, &c., to feed and water. Plenty of room should be left on that side of the stables from which the horses usually approach. Have all arrangements as simple and convenient as possible, and the stable, cow yard sheep yard, stock yard, and house yard should all open on to the race. Paddocks in front of the house and those behind, as well as any small barley or greenfeed paddocks, should also open on to the race. There should be room enough in a little square reserve near the stable (at the end of which the race should start) for a straw stack and a trough of water. The house is usually built on a rise, and the bore and windmill should be on the same level, as then a tank on a 10ft. stand gives splendid pressure to the stable, garden, and house alike. Around the house space should be left for a fruit and vegetable garden, and in mallee land at least two chains of timber should be left on three sides as a shelter from wind. Fowlyards, pigsties, &c., can be arranged at a safe distance from the house and on the outside of the house yard."

LAMEROO (Average annual rainfall, 16·55in.)

March 21st.—Present: 14 members.

Harvest Reports.—Mr. A. J. A. Koch said—"The season1912-13 will be long remembered by farmers on account of its extreme dryness. Had it not been that during July, 1912, very heavy rain fell, and advantage was taken of this opportunity to fallow for moisture conservation, the fallow land might not have been much better than grass land ploughed early and drilled in. Very little rain fell until June, only 4·04in. at my place, 2·32in. of that amount having fallen during February and March. At the end of July another 54 points only had been registered, and wheat that was in the ground and not up was having an extremely bad time. Good and timely rains in August (1·47in.), September (2·26in.), and October (1·74in.) turned what was a most critical position into one of comparative safety, at least for a fair average return, and at the end of October everything looked bright and prosperous. When reaping and cleaning time came so did the disappointments. Crops that looked good enough for 15bush. or 16bush. were only reaping 11bush. and 12bush. Taking a general view of the whole year I have come to the conclusion that land well worked, either fallow or stubble, and given a liberal quantity of super. should always, in ordinary seasons, provide payable returns. In many instances the variety of wheat has a lot to do with the yield. I had 68 acres of Federation drilled in with 90lbs. of super. and 43lbs. of wheat per acre on stubble land skim-ploughed and drilled. It returned an average of 8⅔bush. per acre. Just alongside, stubble skim-ploughed early and cultivated again before drilling a month later than the Federation (which was up) with 60lbs. of super. and 44lbs. of wheat, yielded 9⅓bush., or, with 30lbs. of super. less one extra working, a return of 40lbs. of wheat per acre more. Golden Drop on new land, ploughed, harrowed, and drilled with 46lbs. of seed and 67lbs. of guano super. per acre, returned 6¾bush. Walker's Wonder, 38 acres, 20 of which was fallow, drilled with 90lbs. of mineral super. and 52lbs. of wheat, yielded 10¾bush. Yandilla King, 84½ acres, 11 of which was stubble and new land, balance fallow that was well ploughed, but only harrowed and cultivated in spring, and cultivated, harrowed, drilled and harrowed at seeding, sown from April 30th to May 5th with an average of 40lbs. of wheat and 95lbs. of mineral super. per acre, yielded 16bush. Land fallowed early and during the year harrowed and cultivated many times, cross-drilled with 65lbs. of super. and 35lbs. of King's Early each way, yielded a splendid cut of hay, especially in the heavy flats, where the sand had drifted across. Crossbred 28, sown on fallow with 56lbs. of wheat and 104lbs. of super., yielded 12bush. Cumberland, sown immediately afterwards in the same paddock with 61lbs. of wheat and 104lbs. of super., returned 11½bush. Marshall's, in the same paddock on sandy land and drifted flat, sown a month earlier than the last-mentioned varieties with 95lbs. of mineral super. and 56lbs. of wheat, yielded 16½bush. per acre. I also put in some peas on two acres of grass land, ploughed and well-harrowed on July 21st and drilled in on 23rd and again harrowed. Super. at the rate of 1½cwt. per acre was applied and 1½bush. of peas sown. I fed these off with sheep, and had an average of 34 sheep per day on for three weeks. I intend to sow about 20 acres of this crop this year." Mr. E. T. Wray had sown Bud's Early early in May on fallow. It averaged 8bush. per acre, rough weather having caused it to shake out badly. Thirty acres of last year's fallow ploughed early in the summer, sown to Yandilla King, was badly affected with takeall. Sixty acres of this year's fallow sown with the same variety proved the best crop on the farm for the year. A grass paddock ploughed early in the summer, harrowed after rain in April, was sown with Florence, Baroota Wonder, Golden Drop, Marshall's Hybrid, Federation, and smut-proof wheats. There was no noticeable difference in the yields, except that smut-proof looked best and Baroota Wonder provided the best stubble. Oats sown during the first week in June cut 1½ tons of hay to the acre; 130 acres ploughed early in June, harrowed and drilled and sown with Gluyas and Federation, averaged 6bush. per acre. The former appeared slightly better, but it went down badly. In every instance 70lbs. to 80lbs. of super. per acre was put under the crops.

McNAMARA BORE.

March 1st.—Present: eight members and one visitor.

Cropping.—The following paper was read by Mr. D. Bicknell:—"During the past season I had under crop 250 acres of various wheats under different methods of cultivation. In April I cuiltivated 100 acres with a disc cultivator, and crossdisced about 20 acres. On this I sowed 50 acres of Bunyip and 50 acres of Gluyas. I sowed the Bunyip in the beginning of May, but it came up very thin owing to malting. The Gluyas came up and looked well until the hot winds cut it down in September. Then it ran straight up to ear before it got any more rain, with the result that the heads were small. Where the ground was worked twice the straw grew stronger and the heads larger. I next ploughed 40 acres with a disc plough. On this I sowed 33 acres of King's Early, which yielded 28 bags, and seven acres of Marshall's No. 3, which yielded eight bags. I next cultivated 20 acres twice with the disc, on which I sowed Baroota Wonder and Yandilla, both yielding nine and three-quarter bags, and last I cultivated 45 acres and ploughed 25 acres, in all 70 acres, off which I stripped 69 bags, about half of this coming off the ploughed ground. A small piece of about five acres which I cultivated and then ploughed crossways had a better crop on it, both in straw and larger wheat. The ploughed ground grew stouter straw and larger heads than did the cultivated ground. I also noticed that where the ashes were blown and settled along the east side the crop did better than on the west, showing that where there was more ashes the crop grew better. I also noticed that the crop did better on the south side of the hills than it did on the north." In discussing the paper, Mr. G. H. Perriam said the ground needed potash in addition to super. The past season Federation with very short straw gave a larger yield of wheat than Baroota Wonder with long straw. He had Marshall's sown at the rate of ¾bush. to the acre, which gave a larger yield of wheat than the same wheat sown at the rate of 1bush. per acre, although the latter was showing more straw. Mr. T. E. Bennier said that while roots were in the land from 30lbs. to 40lbs. seed and 40lbs. of super. had given him best results. He did not think it mattered much what kind of wheat was sown so long as it was a good sample of seed.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.)

March 7th.—Present: 11 members and two visitors.

Rabbit Destruction.—Dealing with this subject in a paper, Mr. H. Frahn said that for poisoning with phosphorised pollard, five pints of boiling water should be put into a kerosene tin, from which one side had been cut. About 5in. of phosphorous, 1lb. of brown sugar, and two dessert spoonfuls of cinnamon should be well stirred into the water, about 1gall. of pollard being added whilst the other ingredients were being stirred. Where the rabbits were numerous the poison cart was preferable, but where they were not very thick a small furrow could be scratched around the burrows by means of a garden hoe. Baits should be placed in this during the afternoon. All burrows should be closed a week after poisoning. Sheep should be removed from the paddocks when the poison was laid, and any remaining baits should be carefully picked up. Mr. Tillbrook advised placing a small quantity of poisoned pollard in the burrows when closing them.

PARRAKIE (Average annual rainfall, 16in. to 17in.).

March 14th.—Present: 11 members and four visitors.

Scrub Farming.—Mr. Jose read a paper on this subject, in which he said that scrub should be burnt on the second or third hot day in February or March, and with a north wind. The straw should be levelled with a log or bar. He contended that a good stubble burn was worth 5s. per acre. The strongest shoots should be burnt first. Stubble that was not intended for cropping or fallowing should be sown with ½bush. of oats per acre. The seed should be drilled or broadcasted and harrowed. This would provide good feed for stock. On days in February and March not suitable for burning the time could be employed in cleaning seed wheat, picking stumps, or cutting shoots on the stubble where the straw was thin. He did not see why cutting shoots at this time of the year was not so good as burning, except that the latter was the quickest and cheapest method of getting rid of the mallee. Mr. Beelitz advised burning stubble in preference to cutting shoots. More shoots were killed, and the land benefited and grew better feed. He would not burn scrub until March. Earlier burning gave the shoots an opportunity of growing to an inconvenient height at harvest time. Mr. Lewis would not grow oats as feed on stubble without cultivating. Mr. Beddome also advised levelling the straw, and would burn scrub on the first suitable day in February. He thought this a better plan than risking a fall of rain and perhaps a poor burn. In reply, the writer of the paper contended that a good burn in February was best. A certain number of sticks were always left, and an early burn allowed time to clear these off. If it were left until later this opportunity was often lost, and the farmer was compelled to commence cultivating before the land was cleared. He would just cover the seed of oats intended for feed.

PARILLA, March 12th.—Tree-Planting.—It was decided to take steps to procure a number of sugar gums for the purpose of providing stock shelters in the district.

SOUTH AND HILLS DISTRICT.

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

March 9th.—Present: 15 members.

Vegetable-Growing.—Dealing with this subject in a paper Mr. D. R. Williams said:—"Asparagus might be grown more extensively. It is easily kept going when once fairly established, requires little time and labor at the beginning, and after that there is practically nothing more to do except in the winter to mulch it with well-rotted stable manure and give it an occasional drenching in the summer and keep all weeds down. Growing from seed is a very long undertaking, as the seedlings grow very slowly and cannot be put out of the nursery beds under two years old. It is a saving of time and labor to buy rooted plants. The plant needs well-prepared beds, which should not be any wider than one can reach across for convenience sake. The beds should be subsoiled to a depth of 2ft. or more, and manure such as old bones or cow manure should be mixed with it. Wood ash is very good. It is useless to attempt to grow asparagus without manure. The plants should be put in rows 18in. to 20in. apart, and 12in. between the plants. French beans require no particular soil. They will grow to perfection in stiff red clay if they can get through the surface. Sow in rows 21in. to 27in. apart, accordng to the habit of the variety. For runner beans there should be 4ft. or 5ft. between the rows, and 6in. or 8in. between the plants. I find it is best in sowing beans to flood the land, then plough and work it down, planting straight away into the drills while the soil is moist enough to bring the seed up. Cover the seed to a depth of 2in. They do not require watering until they are a fair size or else they will not make much root. They need to be banked up to give additional hold to the earth. Before they are banked scatter manure along between the rows, Bonedust and sulphate of ammonia are the best. Keep them well watered when they commence to flower and after every picking, which should be done systematically. Beetroot will thrive in almost any soil, but the best results are obtained from a deep loose soil, not too wet, which has been well manured for a preceding crop. Beet will grow any time of the year with little attention and an occasional watering. Sow the seed down about 1in. in rows 9in. apart, and thin the plants out to 4in. or 5in. Cabbages are grown extensively in this district with more or less success, according to the time and trouble taken with them. They need deeply-worked soil with plenty of stable manure worked into it to keep the land open and to let air down to the roots. They are gross feeders and should be treated liberally. They should be hurried from start to finish; if they are checked they will be tough and strong. Quickly grown cabbages are tender and finer flavored than slow grown plants. Cabbages will grow any time of the year as long as there is plenty of water to keep them going. Sow the seed in nursery beds, and when large enough transplant into rows 2ft. apart each way. Cauliflower growing is a fine art, and requires a lot of study. They have not been grown in this district for market purposes. The land must be well worked to a good depth and liberally manured, care being taken never to check the plants after they have been planted out, as they will never come to anything but buttons and seconds. Never plant them after cabbages, but they may follow peas, beans, potatoes, or any root crop to advantage. Keep the ground loose between the plants, and water well to get fine flowers. Force the plants with a little sulphate of ammonia when they are commencing to show signs of flowering. Sow in nursery beds and treat the same as cabbages. Cucumbers to be early should be put under glass in hot beds, and planted out when large enough and when the frosts are over into specially prepared beds 6ft. or 8ft. apart and about 2ft. across. Each bed should be deeply dug and have a large amount of stable manure mixed in with it. For later planting place the seeds in the beds where they are to remain. Keep the hoe and watering can going continually. Lettuce may be grown all the year round. Sow in nursery beds and plant out into rows 9in. or 10in. apart, with 6in. between the plants. Keep them free from weeds and water well. Bonedust and ammonia should be scattered along the rows and hoed in. Parsnips, like carrots, require a deep soil, worked but not freshly manured. If the soil is manured just prior to planting the roots become misshapen and forked. Sow in drills 1ft. apart, and thin to 5in. or 6in. between the plants when large enough. Pumpkins need the same treatment as cucumbers and as much water as can be given them without souring the land. They root at every joint, so it is well to have the land heavily manured. When the main stems have run out 8ft. or 9ft. pinch the crown out of them to encourage lateral growth, on which most melons set. All the melon tribe are alike in this respect. Peas should be planted in rows running north and south in order to get the warmth of the sun on both sides of the plants. The rows should not be any closer than the height to which the peas grow; 18in. is quite close enough for the dwarf sorts. The taller sorts require more space. Staking will keep the pods fairly free from black spot, from which they suffer if allowed to lie on the wet ground. Tomatoes for early planting should be sown under glass in hot beds in July. When 2in. or 3in. high harden them off and plant them out when the frosts are over. If they are planted out early, and frosts are still about, protect each plant with a piece of bagging supported on a stick. They prefer a good deep heavy soil. They are deep rooters, and should not be planted in heavily manured soil. New land is best, but as this tends to make a luxuriant growth of haulm and leaf the fruit, if any, will be late in forming, the first crop being more or less black ended. It is best to establish the plants and manure after by sprinkling bone super. around them, then banking up with the hoe. Tomatoes need plenty of water in the growing season until the fruit commences to ripen. Then cut the supply off and only water occasionally just to keep them going. To trellis tomatoes they should be tied up strongly to stakes and pruned. Just pinch off the shoots that grow out from each leaf; this will keep the leaders growing strongly, When they reach the top of the stakes or top wire, or whatever the trellis is, pinch out the crown and allow it to grow from anywhere, but do not let it grow thick, or no fruit will ripen. Keep the plants open to allow plenty of light and air into the centre of the bushes. They should be 3ft. or 4ft. apart each way and may be grown on the ground without stakes, in which case do not let the leaders grow. Pinch out their crowns, thus obtaining a bushy plant. Turnips to be tender and sweet should be grown quickly in rich soil in an open place. Sow in rows and thin them out when large enough. The tops of the young turnips that are pulled up may be used as spinach."

INMAN VALLEY (Average annual rainfall, 26in. to 27in.)

January 14th.—Present: 10 members.

Beekeeping.—Mr. H. J. Dennis read a paper on this subject. He explained that each colony of bees consisted of a queen, workers, and drones. The mating of the queen took place in the spring or summer. She laid eggs which were fertilised and which produced worker bees, and eggs which were unfertilised and produced drones. Larvæ intended to develop into queens was fed on "royal jelly," and worker larvæ on "bee bread," a mixture of pollen and honey. Workers were undeveloped females. The young bees first appeared as larvæ, in about 10 days changed to pupæ, when the cells were capped, and at the expiration of about 10 days the fully developed bee emerged. The queen lived for from three to five years, and had been known to lay as many as 3,021 eggs in 24 hours—by actual count. In a heavy honey season the average life of the worker was about six weeks, but when honey was scarce it would live for a year or more. The honey was carried in the honey sac, forming part of the digestive system and corresponding to a crop or first stomach. Bees were very sensitive, and any jarring of the hive or crushing of bees would cause the colony to become irritated. The site for an apiary should be sheltered from rough winds and as close as possible to the source of the honey. Langstroth hives were recommended. Top stories should not be put on weak colonies. The worst enemy of the bees in this district was the wax moth, which laid eggs in any cracks in the hive. The grub attacked and destroyed the combs and brood.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

March 14th.—Present: five members and three visitors.

Mylor Type Orchard.—The Hon. Secretary (Mr. R. J. Coles) reported that the Branch had paid a visit of inspection to the Mylor type orchard.

Afforestation.—A paper on this subject was read by Mr. W. H. Hughes. He said—"When the scrub sections in this district were originally taken up they provided straight poles for building sheds, &c., and trees to split posts for fences. There are now no poles left worth mentioning, and none of us could split enough posts on his section to replace all his fences. More than half of the occupiers are buying firewood! Is not it time we began to think seriously of a remedy? The disappearance of our forest trees may mean less rain. Mr. Gill (Conservator of Forests) says that this State can produce as many cubic feet of *Pinus insignis* per acre at Bundaleer and Mount Remarkable in 26 years as can be produced in Germany in 60 years, viz., 6,000 cubic feet. Germany is planting extensively, and if it pays her to do so, how much more will it pay us? The natural question is, 'Can we do it in these hills?' I think we can. I have nearly 3,000 *Pinus insignis*, young yet, but doing very well. Some petted specimens are now 17ft. high at three and a half years from Belair nursery. I also have about five acres of wattles fit to strip, and a large number younger. Mr. Furniss cut a *Pinus insignis* this season. It was of 21 years' growth, and yielded a log 60ft. long, 17in. in diameter at the butt and 4in. at the small end. Last year the same gentleman cut a similar tree, and secured several planks 15ft. long, 9in. wide, by about 1in. thick of splendid looking deal, and a number of smaller boards which would be most useful for mending fruit cases, lids, &c. The fact that all timber costs half as much again as it did 20 years ago shows that the forests of the world are giving out. Well, then, what will the price of timber be in 20 years' time? Farmers maintain that pine posts last longer than mallee in white ant country. These pines do not require manuring, pruning, spraying, or cultivating, and will grow on steep or rocky land that is not fit for fruit. Wattles can be planted between them. Thin the wattles out as the pines grow. Slack days can be spent wattle-barking, and the sticks burn splendidly, even three months after barking. I have wattles 16ft. high at six years from planting the seed. On this ridge on which Longwood is situated the frosts do not cut wattles as they do at Echunga, Mylor, or Scott's Creek."

MACGILLIVRAY (Average annual rainfall, 19in. to 20in.)

February 10th.—Present: eight members and three visitors.

Poultry on the Farm.—This subject was dealt with in a paper by Mr. H. J. Wiadrowski. Poultry on many farms, he said, received insufficient attention. It was not necessary, however, to yard the birds in pens and scratching sheds, such as were adopted on up-to-date poultry farms. Continuing, the paper read—"We should not take eggs indiscriminately for setting, as is generally done, but should have a few selected hens and a rooster penned up, and only use the eggs from these, as blood and breeding are of as much importance in poultry as in any stock. Good birds cost no more to keep than mongrels, and give larger returns. Some think that by running a well-bred cock bird with their hens they are doing all that is necessary; but this is not sufficient, for even amongst, say, only 50 hens there will always be found several that do not pay for their feed. Set several hens at the same time. Then, if for any cause, one should desert her nest her eggs can be distributed among the others. The same applies to the chickens when hatched; give 16 or 17 to each hen and lock up the other hens for a few days. It will then not be long before they are again laying; much earlier than if they are allowed to run with the chickens. One hen, although not able to properly cover 17 eggs, can easily cover and look after 17 chicks. On the day the chicks are due carefully take the hen off the nest twice and take away any chicks that are out. Sometimes after a hen has a few chicks out she will desert the other eggs, and even if this does not happen the chicks are sometimes injured, or some of the unhatched eggs become encased with the other shells, and the chick has a double shell to break. Before giving the chicks back to the hen toemark them in order that their age can be told. A hen more than three years old is kept at a loss. The most profitable breeds to keep is greatly a matter of opinion. For egg-production alone the pure-bred White Leghorn, of a good laying strain, is the best. I have had very good results from a Leghorn-Orpington cross, which produced a good large bird and also an excellent layer of a good large egg. However, for a general utility bird I favor the Black Orpingtons, provided they are a good laying strain. Give the birds as much variety as possible in their feed. Of course this is not as necessary as where birds are continually penned up, but they will do better if they are given a change, such as an occasional feed of oats or barley when they are always fed on wheat. Chopped greenstuff will also be greatly appreciated by the birds. The hens do far better if the cockerels are kept apart. Better housing will greatly increase the egg-production. Often the birds are left to roost in the trees. They not only require more feed but are affected in their laying as well. Old 400gall. tanks make very good shelter sheds. These, with perches made like a ladder with a good lean, will easily accommodate 30 to 40 birds. Ducks and geese are not as a rule as profitable as well-bred fowls, especially where they do not have an abundance of water. Turkeys are very profitable, but the iguanas and crows do a lot of mischief, both to the eggs and young poults; but if they are kept penned up for the first few weeks until they are fairly strong the losses will not be so big. Here again it pays in the first place to buy well-bred birds for starting the flock."

MENINGIE (Average annual rainfall, 18·87in.)

March 14th—Present: six members and one visitor.

Vegetable Cultivation.—A paper on this subject was contributed by Mr. J. G. Hastings. He said—"In a district like ours, which is much exposed to storms in winter and hot winds and drifting sand in summer, a windbreak is an absolute necessity. The garden plot should not be more than quarter of an acre in extent and wind-proof on all sides. This can be done cheaply with light brush woven between wires; an evergreen creeper should be grown, which in time will take possession of the brush, and when trimmed will improve the appearance of the fence. It takes less from the soil than a hedge of more vigorous growth, and is much more easily kept in order. For choice of soil I prefer rich sandy loam, for, unlike the heavy black land, it is better drained and does not remain wet and cold during the winter months. while in summer, with surface cultivation, it retains the moisture and ensures a better return in produce than the latter. During the summer months the land should receive a liberal dressing of stable manure, which should be well rotted if possible and then dug in. If it gets a good soaking rain so much the better. This will hasten the process of decay. From then on till the time of planting out the soil should be frequently stirred with the hoe to admit the sun and air, which will sweeten it as well as add to its fertility. At the time of transplanting it should again be dug over to incorporate the manure with the soil. when it will be more readily available as plant food. After the first crop of vegetables is taken off the soil will be in the right condition for growing root crops, which do not thrive on manure freshly dug in. The hoe should be kept at work from the time the plants are set out until they have finished growing. It is a mistake to wait till the weeds appear, for once they get a start there will be no end of work. The soil must be kept stirred from the beginning to check their chance of sprouting, as well as assist the growth of the young plants by admitting warmth and air. In the case of summer crops the surface cultivation helps to retain the moisture and dispenses with a considerable amount of watering. During the present dry summer I noticed that tomatoes grown in the shelter of the windbreaks required little or no water whilst they grew larger and more vigorously than those in exposed situations, which received much more water. They also yielded a heavier crop of fruit. The reason for this is that there was less evaporation and no wind to knock the bushes about and cause the blossoms to fall. I also tried spreading straw and other litter around melons and tomatoes which were exposed, with fairly satisfactory results; but they still took too much water. Too much watering in sandy soil, because of its loose nature, results in the plant food being carried out of reach of the roots. I strongly favor surface cultivation, with a light watering occasionally. There should be windbreaks running through the centre of the garden to check the wind as much as possible."

MOUNT PLEASANT (Average annual rainfall, 26·87in.)

March 13th.—Present: six members.

Tree Lucerne.—Mr. H. H. Giles read a short paper as follows:—"I see very little tagasaste around here, and conclude its value is unknown or overlooked as a vigorous, quick-growing shrub and good fodder when greenfeed is scarce. It must be protected from stock or it will be eaten out. Grown in enclosed land it makes an excellent breakwind, in five years or less attaining the height of at least 10ft. It may be often pruned or cut back to ensure a thick growth. Bees are fond of the blossoms. When cut in small sheaves and suspended by its stems poultry are fond of it. It is specially valuable for shade, and should be grown not only to shade poultry but for pigs, provided they cannot get at the stem. The exhibit now tabled has grown since December 5th, 1913, and is about 3ft. 9in. high. I am surprised at its quick growth considering the dry, and at times very hot, weather we have till now experienced; and although I daily prune some I can soon get a second cut, and would not be without it for poultry." Whilst some members thought this plant of no use for food for stock, Mr. Giles and Mr. Tapscott maintained that it provided good stock feed, and it was especially good for fowls when grown in fresh ground.

MYPONGA.

March 15th.—Present: 10 members and two visitors.

Destruction of Farm Pests.—Mr. Bartle contributed a paper on this subject. He dealt chiefly with the eradication of rabbits. He advised netting the paddocks and grubbing burrows. During last winter he had employed several men to dig out burrows, and, although it was costly, the results proved that the expense was fully warranted. He advised the destruction of as much cover, such as scrub, as possible. Though the death of many lambs was attributed to foxes, he considered many of the supposed victims died from natural causes. He had seen many dead lambs that had not been touched, and when passing a few days later, had noticed that the tongues had been eaten. Members generally agreed with the views expressed in the paper.

NARRUNG (average annual rainfall, 17in. to 18in.).

March 7th.—Present: seven members.

Manures.—This subject was dealt with in a paper by Mr. C. H. Metcalf, in which he said—"When considering the value of a fertiliser, it should be borne in mind that the agricultural value and the commercial value of fertilising materials are not always in harmony. A fertiliser is cheap, whatever it may cost, if its use increases the crop to such an extent as to result in a fair profit. Most soils contain an abundance of plant foods, but generally only a small portion is available for the plant itself. Some of the manures used at the present time do not always fulfil the requirements of the district in which they are used. It would be of great benefit and interest to the man on the land if he were to conduct a series of manurial tests. Heavy dressings of phosphatic manures, for example, would increase the crop-carrying capacity of South Australian farms. Some farmers are quite content with light dressings of from 30lbs. to 60lbs. per acre. This I have found to be a very serious mistake, because the crop takes off more phosphoric acid than is put in. Additional manure would help the natural herbage, and so increase the humus in the soil. A few simple experiments, then, could be conducted on the farm, for there is nothing to prevent every farmer being his own experimentalist. A time will come when we shall find that our soils must have this attention. The farmer experimentalist who thinks of carrying on a series of manurial tests over a large area, such as the field, will find that he would be better off at the end of the season if he were to adopt the plot system, thereby gaining more control over the tests and more time for observation and correction. Perhaps one of the most valued manures we have is farmyard manure. How many of us use it to its full value? Some farmers, while knowing the valuable properties of this, will not go to that little extra trouble of taking it just a little farther in the paddock, but are quite content to allow it to lie for years in the yard or heap, or, worse still, to remain near wells, rock-holes, soakages, &c. I feel sure the farmer, or man on the land, no matter what he may be growing, would be amply rewarded for the extra work if he were to evenly distribute it over his land. Much more thought should be given to this all-important 'waste' of the farm. Another 'waste' that has at times been of use in the orchard is hen manure. This contains four times the strength of stable manure, and is a splendid improvement in the orchard. Pig refuse is another noteworthy item, this being an important vegetable forcer; thus it will be of interest to the farmer who grows his own vegetables. Sea shells, on account of the lime they contain, constitute another fertiliser. Lime is an all-important dressing for some of our lands. The action would be much quicker if the shells were crushed before being applied to the soil. Years ago some farmers used to buy a highly soluble variety of super. and mix it with sand, thus getting it to the strength they required. Coming back to the value of lime, I wish to point out that with its application to strong soils the physical action is most manifest. Our own soils would be much improved by a dressing. There are two ways in which manures may work on soils—by supplying plant food direct, and by acting on the food already in the soil and making it more available to the plant. A good manure for potatoes is 23lbs. of potash and a like amount of mineral super. Wood ashes and bonedust are two good fertilisers for potatoes. If we require a quick-acting nitrogenous manure, we cannot do better than apply nitrate of soda. It can be used with advantage with other fertilisers. Nitrogen is the costliest ingredient in fertilisers, and it is to the interest of every farmer to restore all kinds of waste material of a nitrogenous character to the soil. Vegetable and animal refuse should be carefully looked after, and used when the time allows of so doing."

STRATHALBYN (Average annual rainfall, 19·28in.).

February 10th.—Present: 12 members.

Sheep Dips.—Mr. R. H. Haines contributed an instructive paper. He described a sheep dip capable of dealing with 1,000 sheep daily. Mr. Cumming, who had had 30 years experience with sheep, made eulogistic reference to the dip. Detailed particulars of construction were given as follows:—*Dimensions* (inside measurements).—Length from extreme aft end to the fore end, 21ft. 6in.; and from the aft end, 18ft.; length at bottom, 12ft.; width at top at shoulder line, 18in.; width at bottom at angle, 12in.; depth, 4ft. 3in., including a 3-in. set-off at top and V shaped bottom, 6½in. *Construction.*—The dip is built of concrete with boards. If made with Strathalbyn lime the proportion is four of clean sand and gravel to one of lime; it should be well mixed and dry enough to ram properly. If too wet it will crack. It must also be thoroughly well set and dry before the cement is applied. The cement for plastering should consist of two of fine washed sand to one of cement. If cracks appear and cause leakage they should be chiselled out and rinsed with water, then filled with good cement. *Capacity.*—The average number of gallons to the inch is 10½, but when refilling it is necessary to allow about 14galls. to the inch. At the 4ft. line it holds about 504galls., but 421galls. or 3ft. 6in. deep is enough for dipping. *Cost.*—Six bags of lime at 2s. 9d., 15s. 9d.; and 2cwts. of cement at 7s. 6d., 15s.; 30s. 9d. in all. It will take about 40 hours for two men to complete the job, including the yard, etc., if the material is on the spot. The material required for the yard, which is 10ft. by 8ft., with sloping sides (holding about 45 sheep), is 40 5ft. 3in. slabs; six posts each 6ft.; two 9ft. rails; two 7ft., and one 10ft. 6in., and a small gate. Two posts are needed at the extreme aft end, and two 7ft. from it. The boards used in the construction of the walls (which are 4in. thick to top of ground and 6in. above it) can be used to cover the end. The slide door is fastened on the yard where it crosses the dip. The yard may be placed on either side of the fore end, according to convenience, or straight out, which is better, if the ground is rising that way or level.

Fencing Act.—Mr. C. Pyne read an interesting paper dealing in detail with the provisions of this Act.

STRATHALBYN (Average annual rainfall, 19·28in.).

March 19th.—Present: 12 members.

The Rabbit Pest.—A paper on this subject was read by Mr. W. H. Cuming. The annual loss through rabbits at present was more than it had been 20 years ago, he said. He dealt with the damage which had been wrought on the station properties, and the legislative measures which had been introduced to encourage the destruction of the pest. He contended that if the legislation at present in force were put into operation rabbits would be effectively cleared out from most places. The poison cart was very effective on large holdings in hot, dry districts, where the feed grew quickly and dried quickly after rain, but in the south, where there was green feed until the end of the year, it should not be used. Immediately the first good rains fell in autumn burrows should be dug out and filled in, rock-holes filled, and rubbish and hollow logs burned. One half-day per week subsequently spent in destroying any rabbits remaining on the holding would effectively deal with the pest. If every landholder did his duty in this regard, thousands of pounds would be saved annually. If he did not undertake the work without compulsion, the law should be set in motion. The presence of rabbits was largely responsible for the great shortage of store sheep which existed in this State at present. He appealed to every landholder in the State to devote some time to the destruction of rabbits, wild dogs, and foxes. Members discussed the subject at some length. It was thought that the practice of the district councils appointing local inspectors tended to make it more difficult to deal with the pest. It was suggested that the inspectors should have power to issue summons without having previously placed a list of defaulting landholders before the council.

CHERRY GARDENS, March 10th.—EXHIBITS.—Messrs. S. W. Chapman, T. Jacobs, C. Lewis, H. J. Jacobs, and H. R. Stone tabled samples of fruit and vegetables. Various matters of interest relating to cultivation, pruning, and spraying were discussed.

HARTLEY, March 11th.—EXPERIMENTAL PLOTS.—A committee of four was appointed to supervise experimental plots to be conducted by Mr. B. Wundersitz. It was proposed to test different quantities of super., ranging from 50lbs. to 200lbs. per acre, on four plots each one acre in extent.

MOUNT BARKER, March 18th.—AGRICULTURAL SHOW.—The exhibits at the recent local agricultural show were discussed. Mr. H. Jones dealt with the grain section, Mr. G. Milne the fruit section, Mr. C. Miels the poultry section, and Mr. Monfries the stock. Several suggestions were made and forwarded to the Agricultural Society.

MYPONGA, February 24th.—The Horticultural Instructor (Mr. Geo. Quinn) delivered an address. The orchard of Mr. F. Pengilly was inspected, and generally the visitors were agreeably surprised at its condition. Jonathan, Strawberry Pippin, Rhode Island Green, Rome Beauty, Reinette de Canada, Northern Spy, King David, Lord Nelson, and Cleopatra apples were doing particularly well, although the last mentioned were slightly affected with the bitter pit. Not more than 3 per cent. of the fruit was affected with the codlin moth, which was attributed to systematic spraying and cultivation. About 20 porkers were being fattened on windfall fruit and peas; and members were also interested in a paddock of Paspalum and an African grass of the Panicum family, resembling Crus gallai.

PORT ELLIOT, March 21st.—PRUNING.—Mr. A. W. Gordon read a paper dealing with the subject of pruning. He quoted two letters, one from a local orchardist and one from an orchardist in New Zealand, both of whom advocated the practice of allowing the trees to follow their natural growth until such time as they reached the required dimensions. Members discussed the matter at length, but could not agree with the idea of planting the trees closely in a dry climate such as that experienced in this State.

SOUTH-EAST DISTRICT.

MOUNT GAMBIER (Average annual rainfall, 32in.)

February 21st.—Present: 13 members.

BARLEY-GROWING.—An address on this subject was delivered by Mr. J. W. Innes. He mentioned that owing to the unfavorable nature of the season a large percentage of the barley grown in the district last year was unsuitable for malting. The variety generally grown here was Duckbill. He tabled two samples of grain: one constituted part of the third crop of barley taken off one paddock in four years. In 1911 it yielded 38bush. and the grain was one of the best samples in the district. In 1910 the crop was also a good one, and the sample prime. He had never seen a poor sample off the paddock, and yet on the better land on the same farm barley crops were spoiled by the wind. Manure helped to give the good quality to the Millicent crops, but he did not think it was of any use here, because the heavy rains caused the manure to leach out of the soils. He was more inclined to think that the earlier sowing at Millicent was an advantage. If they sowed late the growth was rapid and the stem was softer, and so could not withstand the hot winds. Farmers here said that they could not sow too early because of the weeds and caterpillars. In his experience in the barley trade he had always noticed that the early samples were the best. This year all the late crops were hardly fit for malting. In regard to the caterpillars it was generally thought that they were hatched in the ground,

but farmers who had watched the pest told him the larvæ were deposited behind the flag. If that were the case they would need to use something in the way of spray, like they were using on potatoes. If the pest were destroyed early the damage would not be so great as was the case with their present method of sowing poison. Mr. Sassanowsky said if they sowed late the barley grew quickly, and the main thing was to get it through without any check in the growth. This year all the barley on light soils was affected with the wind. He had sown during the first week in August. The heavy patches were good. His idea was that in the early part of this year they had a wonderful growth, with any amount of flag, and when the heavy hot winds came there was not sufficient strength in the soil to keep the sap flowing. Mr. G. H. Kilsby said the wind was most likely to affect the crop when the grain was in the milky stage. At Moorak later sown barley yielded the better sample. The ranker the growth the more susceptible it was to hot winds and grubs. Mr. MacCormack thought the first week in July the best time to sow. Mr. Innes, in reply, suggested that in the event of the crops becoming too heavy at the beginning of the season, as had happened this year, they should be fed off.

NARACOORTE (Average annual rainfall, 22·60in.)
February 14th.—Present: 14 members.

THE PLOUGH.—A lengthy paper dealing with this subject was contributed by Mr. J. M. Wray. Anxiety to get a large area under crop, he said, was one reason why so much ploughing was done badly. Whilst occasionally a roughly worked field might return a good harvest, it would generally be a failure: whereas a well-worked area generally yielded well. Continuing, the paper read—"The first and second seasons at Hynam I used a three-furrow stump-jump plough, but when the rain set in properly I found that even on high ground the plough and the horses bogged. I then tried two small ploughs—both two-furrows—and my experience is that one can do far better work with this class of plough in wet seasons than with a stump-jump implement. There is less draught, and therefore less tendency to draw the plough deep into a soft place. In taking note of those who have persisted in using the stump-jump plough during the last two years, when farmers have been able to plough early and turn the soil over in a more suitable state all through the seeding, I find that equal crops have been grown from land treated with the stump-jump and set ploughs. A settler should take care to choose the plough most suitable for the class of soil he has to work. Where grass grows freely and there are only odd stumps to deal with a plough that cleans better than a stump-jump and one that will make an excellent job of turning the grass under is needed. In order that an efficient implement can be secured it is necessary to bring the soil in this district under the special notice of competing manufacturers. This can be done by field trials." He strongly urged members to make arrangements for a field trial. In discussing the subject Mr. Bray said a nice even ploughing would kill grass, but it was necessary to turn the ground over roughly and allow it to lie open to the sun to destroy sorrel. Mr. S. H. Schinckel found it almost impossible to plough his land when it was wet. The general opinion of members was that a plough which would deal with the land when it was dry, and so enable them to destroy sorrel, was necessary.

NARACOORTE (average annual rainfall, 22·60in.).
March 14th.—Present: eight members and one visitor.

THE SEASON'S CROPS.—Mr. Schinckel said that in his locality Federation and Yandilla King were the wheats most extensively sown. Federation gave the heaviest yield, but it was badly affected with rust. Yandilla King yielded the best average. The yield of Federation was about 18bush. per acre, and Yandilla King yielded 20bush. Duckbill and Cape were the principal sorts of barley grown, and Duckbill yielded from 20bush. to 50bush. per acre. He could not say what Cape yielded. Mr. Pallant found Yandilla King yielded the best this year. Federation was not so good, as it was affected with rust. In previous seasons he had found Federation the best. Mr. Kelly had only sown Federation, and it had yielded 21bush. last year and 27bush. this season. There was a good deal of rust in it, but it did not affect the yield. He also had some Algerian oats which yielded 25bush. per acre. Mr. Heffernan said his Yandilla King returned 24bush., and Marshall's No. 3 27bush. Mr. Schinckel said the high winds that prevailed just when the wheat was ripening, and the grubs, affected the yield in many places. Members thought, in reply to the Chairman, that they could take the estimates given as applicable generally to the whole district, but it was impossible to get accurate returns.

KYBYBOLITE, February 19th.—The Superintendent of Agriculture in the South-East (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.), gave an interesting and instructive address dealing with harvest returns of the Kybybolite Experimental Farm.

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T. PASCOE,
Minister of Agriculture.

POINTS FOR PRODUCERS.

International Plant Diseases Convention.

As the result of the Phytopathological Conference at the International Institute of Agriculture, attended by delegates from 35 countries, certain States, not named in the report, pledge themselves to take whatever legislative and administrative measures are necessary to prevent the distribution of all diseases of plants in their own countries, but specially to organise an effective service of supervision over nurseries, gardens, glass houses, and other establishments which carry on a trade in living plants. The proposed Convention, however, excludes vines, grain, seeds, tubers, edible bulbs, rhizomes, and roots, as well as fruit, fresh vegetables, field roots, and general agricultural produce. The measures include (*a*) the erection of one or more institutes for scientific studies and research ; (*b*) the organisation of an effective service of supervision over nurseries, including the packing and dispatch of plants ; (*c*) the issue of phytopathological certificates. They would bind themselves only to admit plants accompanied by phytopathogical certificates issued by or from a competent official authority, except in the case of plants which are imported for scientific research at an institute authorised by the Government. The omissions, says the *Agricultural Gazette*, include some of the most important products subject to diseases which it is desirable to control.

Export of Fruit.

The general manager of the Government Produce Department received a cable on April 15th from the Trade Commissioner in London, stating that the prices realised for this season's first shipment of fruit, which left South Australia by the *Marmora* on February 26th, and consisted of 125 cases of apples, 38 cases of pears, and 68 half-cases of pears, were as follows :—

No. of Cases.	Class.	Variety.	s.	d.	Average Price.
50	Apples	Worcestershire	13	0	per case, c.i.f., London
60	"	Cleopatra	12	6	" "
15	"	Jonathans	11	3	" "
38	Pears	Beurre Bosc Backhouse Bergamot	15	0	" "
68 (half-cases)	"	Backhouse Bergamot Beurre Bosc Beurre Diel	6	6	" "

The results above given show that the London market has opened very satisfactorily for fruitgrowers, and good prices should now be maintained through the season, especially as advices state that the London market is practically clear of American and Canadian supplies.

Beef Cattle Industry in the United States.

The beef cattle industry in the United States is in a most precarious condition, according to a report sent to the International Institute of Agriculture. This seems to be apparent from the fact that between January, 1907, and January, 1913, the number of beef cattle in the United States decreased by 15,970,000 head of cattle, or about 32 per cent. During the same period the population increased by about 10,000,000 people. And conditions, instead of improving, are going to be worse in the next two or three years. A few weeks' study of any of the stock yards markets will convince the most optimistic person that there are altogether too many cows, heifers, and calves being rushed to market. It is, wrote a visitor to the markets, a most pitiful sight, in the face of the present great shortage of cattle, to see that from 15 to 40 per cent. of the animals offered for sale are good young she stuff, just the kind needed for breeding purposes on the farms. This condition of affairs can mean but one thing, namely, fewer and fewer cattle in the years to come.

Condensed Milk Manufacture in Canada.

The manufacture of condensed milk and milk powders is becoming an important branch of the dairy industry in Canada. There are, states the February bulletin of the International Institute of Agriculture, 12 large factories engaged in preparing these products, and the number is likely to be increased. A total of 69,264,090lbs. of fresh milk was used for this purpose in 1910, out of which there was manufactured 27,831,596lbs. of finished products. The quantities are much larger at present, but the exact figures are not available. The principal seat of the industry is in Western Ontario.

Compound Fertilisers in the United States.

At the date of the last industrial census there were 550 chemical manure factories in the United States, with a capital of about £24,000,000. The great bulk of their trade is in the preparation of compound manures containing two or more ingredients of plant food. Thus, in one important province, while the total deliveries of chemical manures were over 150,000 tons, not more than 25,000 tons were simple fertilisers containing only one ingredient of fertility. Most of the mixtures contain 2 per cent. of nitrogen combined with phosphate—chiefly soluble—and potash. Every bag of manure must by law have attached to it a tag showing the analysis, and the authorities have a number of inspectors whose duty it is to take samples and have them analysed.—*Mark Lane Express.*

Sow Good Seed.

Good seed is the foundation of good crops, and as many farmers are now getting supplies of seed, it is opportune to point out the wisdom of being careful in the matter. Some farmers, says the *Mark Lane Express*, take great trouble to get the soil in good condition and furnish it with manure, but are careless about the seed, and yet how hopeless it is to expect a satisfactory crop if the seed is faulty. Even when dealing with reliable seedsmen it is as well not to take everything for granted. The seed may be pure, but owing to having been gathered in a wet season may have suffered in its germinating power. If the germination is poor, it is necessary to use double the quantity of seed, or the crop will be poor. Avoid cheap seed ; it is seldom really cheap, and too often leads to disappointment.

Egg-laying Records.

New records in egg-laying by pens of six pullets were established in the Burnley and Bendigo (Victoria) 12 months' contests which concluded on April 15th. In the first-named competition Mr. J. H. Gill's White Leghorns laid a total of 1,668 eggs, thus beating the previous best score of 1,632, which was put up in New Zealand last year. In the Bendigo contest the winning pen of six White Leghorns, owned by Mr. H. Hanbury, laid 1,675 eggs, or seven more than the Burnley record.

The World's Crop Production, 1913-14.

The March number of the *Bulletin of Agricultural and Commercial Statistics*, issued by the International Institute of Agriculture, contains a table with the crop figures of 1913-14 in the Southern Hemisphere. The total production of wheat in Argentine, Australia, and New Zealand is calculated at 68,113,670 quintals, or 88 per cent. of that in 1912-13 ; the production of barley and of oats in Argentine and New Zealand is estimated at 2,021,480 quintals (158·1 per cent. of that in 1912-13) and 12,837,225 quintals (66·9 per cent. of that in 1912-13) respectively. The area expected to be harvested for maize in Argentine is valued at 4,152,000 hectares, or 108·4 per cent. of that in 1912-13. On adding these figures for cereal production in the Southern Hemisphere to those formerly published for the production in the Northern Hemisphere, the Bulletin follows up with a table giving the world's production. These productions are :—Wheat, 1,066,527,734 quintals, or 107·4 per cent. of last year's ; rye, 469,442,761, or 100·5 per cent. ; barley, 339,494,094, or 109·4 per cent. ; and oats, 681,251,693, or 101·7 per cent. For rice another table shows the production in the Northern Hemisphere only, which amounts to 374,572,888 quintals, or 99·6 per cent. of that of last year, for the following countries :—Spain, Italy, United States, India, Japan, and Egypt.

Statistical Position of Barley.

The statistical position of barley compared with the two previous years is given in *Beerbohm's Evening Corn Trade List* of March 20th, as follows :—United Kingdom imports from August 1st to March 14th—1913-14, 4,274,000 quarters ; 1912-13, 5,030,000 quarters ; 1911-12, 5,423,000 quarters ; afloat for United Kingdom and Continent, 1913-14, 1,080,000 quarters ; 1912-13, 960,000 quarters ; 1911-12, 675,000 quarters. English average price, 1913-14, 26s. quarter ; 1912-13, 27s. 11d. quarter ; 1911-12, 31s. 2d. quarter.

United Kingdom Imports of Wheat.

Replying recently to a question asked in the House of Commons, Mr. Runciman (President of the Board of Agriculture) stated that on the assumption that the whole of the wheat imported into the United Kingdom was for human consumption, and that about 15 per cent. of the home crop is used on the farms for seed, &c., the proportion of home to total wheat consumption was 22 per cent. in 1894, 12 per cent. in 1904, and 16 per cent. in 1913 ; 1904 was a year of exceptionally low production in the United Kingdom.

A Concrete Silo.

Last summer, writes a correspondent in the *American Agriculturist*, I built a solid concrete silo, and after one season of use I am very much pleased with it. It has a 6-in. wall, is 14ft. in diameter, and 33ft. high. The roof, chute and all are built solid of the same material. I consider all makes of silos good, but like the solid concrete silo best and believe it the cheapest in the long run. My silo cost 450 dollars, and I had to do the hauling of gravel and cement, which would have cost 50 dollars more if I had paid for this. A man cannot appreciate the true value of a silo until he owns one. We started the corn binder when the corn was ripe enough to put in shocks and hauled it directly to the cutter. It took five hayracks and four men in the field to put fodder on them. One man fed the cutter and one stayed in the silo to keep the silage evenly distributed and well packed. We filled our silo in one day, putting in about 110 tons. It takes from eight to 10 acres of corn for a silo this size, depending on the yield. This will feed 40 head of cattle through the winter for three and a half months with no other feed than straw. This is exactly what we did with it on our farm last winter, and the cattle gained from 100lbs. to 125lbs. apiece, depending on their size and age. You may figure this corn that we put into the silo as equal to 500bush. at 50 cents a bushel, making 250 dollars, which would be just about equal to the growth of the cattle, but in addition to this we hauled out manure enough to cover 20 acres of ground heavily, and I fully believe this will be worth 20 dollars an acre.

Feeding Young Pigs.

The rations for young pigs, when they have been arrived at, should be given methodically, say, three times a day, and if profitable results are to be obtained the sty in which they are fed should be clean, warm, and well ventilated, but should there be an excess of heat troubles are sure to come. The study of the proper scientific operations from the point of view of protein or albuminoids, non-protein substances, or fat and carbohydrates, would take up too much space, but it may be of interest to know what has been found of value in actual practice. The best-flavored pork and the heaviest weight of the same was obtained in the case of milk-fed swine, and next to milk came the cereals, corn, barley, oats, and peas. Potatoes produce a soft, light pork, which loses a good deal in boiling. The meat of swine fed on flour-mill by-products is yellow, without body, and of a poor flavor. Oils meals produce a loose, oily pork of an unpleasant flavor. Beans produce a hard, indigestible, and flavorless pork, and acorns one that is light, hard, and unhealthy. Milk is looked upon as being the principal mixture with cereal foods, and there is little doubt that this is correct. There are now ample supplies of separated milk in all dairying countries, and this must be looked upon as being an excellent food for swine.—*Agricultural Gazette.*

Of Interest to Sheepgrowers.

Mr. Henshaw Jackson writes :—

The best returns from feeding sheep are obtained by keeping each draft of fats as evenly good as possible.

The more sheep you can keep and keep in good condition the less per head will be the cost of keeping.

Those who keep mixed flocks of sheep cannot expect top prices for their wool clip.

A sheep that is in good condition for growing a healthy fleece has a double value to the farmer, who then caters for the butcher and the cloth merchant.

The best sheep for the farmer is the one that is most adapted to the particular surroundings and situation of its owner.

Sheep are good weed destroyers, but do not expect to raise good mutton without fair pastures. What the sheep can do for you as weed killers and automatic manure spreaders, make up to them by putting good grass into the holes the weeds came out of.

Sheep-pasturing is not altogether easy. Amateurs and novices think it is, and make failures. Sheep pastures should not be overstocked, but rather changed a couple of times a year if possible.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

"F. T." requests (1) treatment for working horses suffering from sore shoulders, and (2) advice concerning mare which has a film over eye as large as a currant, from the corner of which matter oozes.

Reply—(1) As a general dressing this is found very useful, both as preventive and curative—White lead 2ozs., neatsfoot oil 1 pint, to be applied to sore and collar two or three times a day. Beat the collars well as soon as dry, and if branbags will not prevent sores try sheepskin, wool to horse, or strips of zinc on the collar. For the one with proud flesh, dress twice daily with a little of this—Resublimated iodine 1 dram, methylated spirit 6ozs. When the wound seems to be healthy apply twice daily a few drops of tincture calendula. Let all the horses have daily as regular thing a teaspoonful of flowers of sulphur in their chaff. (2) The symptoms point to one of the little cancerous growths on the third eyelid caused by the irritation of flies. It will eventually have to be cut off—not a very difficult proceeding if a veterinary surgeon is obtainable; in the meantime blow into the eye twice a week a few grains of boracic acid.

"B. B.," Wilkawatt, has a horse which has been unwell for a few weeks; he stands all the time, never lies down; his breathing is very heavy, and he only nibbles at food. He is tired and sleepy.

Reply—The symptoms point to inflammation of the lungs, and probably little can be done after so long; but he may be tried with 20 drops of Fowler's solution of arsenic three times a day put in the mouth with a little molasses or bran.

"E. J. S. A.," Coonawarra, inquires in regard to a pony which is usually fat and gay, but lately has become dull, heavy, losing flesh, and eats dirt.

Reply—Suffers from indigestion, and will probably benefit by receiving in food twice a day a flat tablespoonful of this powder—Baking soda ½lb., sulphur ½lb., nux vomica ¼lb., gentian ¼lb., brown sugar ½lb.

"J. E. P." asks how often and for how long does a sow come on heat.

Reply—When not in pig or suckling, a sow usually comes on heat every 21 days for three days.

The Meadows Agricultural Bureau asks information concerning a ewe, which after being killed was found to be full of water. There was a hole in the bladder large enough to insert a straw. The ewe was in good condition.

Reply—The condition is dropsy, the hole in bladder (situation not named) is probably entrance of ureter, pipe from kidney. The probable cause of the condition is the germ which produces the large abscesses often found in sheep, the early stages of the disease being of a dropsical nature.

The Lameroo Agricultural Bureau asks treatment for a colt which has an abscess on side of and between lower jaw.

Reply—Probably the result of injury or teething. Open out and seek for grass seed or similar irritant, then swab with iodine 1 dram, methylated spirit 1 pint. When healing dress with Stockholm tar.

The Strathalbyn Agricultural Bureau reports that a member had a horse which developed tetanus (lockjaw). The animal was treated with tetanus antitoxin, the serum being injected in the neck, with result that it recovered. They ask if the Government Veterinary Surgeon keeps a supply of the antitoxin.

Reply—The leading European authorities are agreed that this antitoxin is very useful as a preventive of the disease, but is of little avail as a curative. Nature, however, is very kind, and often allows recovery without and even in spite of treatment, so that one must beware of the logical fallacy, *Post hoc propter hoc*. The Agricultural Department does not stock sera or other remedies, but has never found any difficulty in procuring them from the druggists.

"A.," Bews, asks—Are cows in calf less liable to dry bible than those not in calf ?

Reply—Not necessarily, but barren cows as a rule do not get as good feed as the rest. Also maternal instinct compels an in-calf cow to do her best for her future offspring.

"A. A. L.," Keith, asks treatment for horse which has been treated for sand, but is out of condition and is always turning up his nose.

Reply—If his eyes are yellowish the turning up the nose points to disordered liver, which would seem to be the case from the general symptoms; a physic ball—6 drams—should work him if he is prepared by feeding bran mashes for two days, and it would be advisable to try this again after its effects have passed off; 20 drops of dilute hydrochloric acid in his drinking water once a day for a week or two should pick him up.

"W. T." writes—"I am still having trouble with the sheep blowing on the lucerne. I have tried putting them in three times a day for half an hour each time, but still I have losses. If I cart out lucerne hay they only half eat it and soon get hollow and tucked up, wanting to get back on the green feed. The lucerne is too short to run the cattle over it. I have tried cutting all that was any length, but what is left seems to blow them, and what is cut they do not care to eat."

Reply—Apparently the quick growth of the lucerne is the cause of the trouble, which should be lessened if the sheep can be steadied with a bellyful of dry stuff before going on to it, and they should never go on before the sun is well up or when it is damp from rain or dew, nor should they stay on more than a few minutes at a time to start with. A lick of equal parts common salt and sulphur may help, if the sheep will take it with dry feed at the rate of ½oz. salt and ½oz. sulphur per head. When blown they may be quickly relieved by passing an ordinary horse catheter, without its cane, down the throat and allowing the gas to escape. Half an ounce hyposulphite of soda put into the mouth dry is also useful; or about 20 drops of carbolic acid, lysol, or similar disinfectant given as a drench with two tablespoonsful of water; or half a teaspoonful of household ammonia in a similar amount of water; or a half a teaspoonful of powdered carbonate of ammonia put into the mouth with a little molasses.

"A. J. H.," Coonawarra, has a mare which, after drinking or having been driven, holds her head up and turns up her top lip. She does not thrive well.

Reply—As the mare is four years old she is about to cut her last four molar teeth, corresponding to the human wisdom teeth; this is always a trying time for horses, and the symptoms are caused by it; the turning up of the lip generally points to derangement of the liver, so it would be well to keep the bowels loose with a bran mash every night for a week, and get from a chemist half a dozen powders, each containing mercury and chalk 20 grains and sugar of milk 20 grains, put one of these either in the mash or on the tongue each evening and improvement will follow.

"F. G. F.," Brooker, asks treatment for horses which appear very tired and dejected, the result probably of having had to drink inferior water. Bloodworms are suspected. They also eat clay from sides of the dam.

Reply—The history and symptoms certainly point to infestation by parasites, and arsenic is indicated, as so often prescribed in the *Journal*; also arsenical preparations can be obtained very reasonably from the chemists at Port Lincoln and Tumby Bay, who would supply the directions with their preparations. It would be well to treat the water with chloride of iron, as recently described, or, in the alternative, 1lb. chlorinated lime per estimated 1,000galls. stirred into the water every week or two is advisable. For the very weak ones, 20-30 grains, roughly a teaspoonful, of sulphate of quinine once or twice a day in a little bran will be found useful.

"R. C.," Alford, has a 5-year-old gelding which has been suffering from abdominal pain on and off for the past 18 months. The horse improves a little with rest, but fails again when at work. He has been treated for sand and bots without good results; condition powders fail; and he looks like an old worn-out horse.

Reply—A veterinary surgeon, seeing the horse, would probably be able to diagnose the complaint, otherwise it is impossible; the symptoms are those of cancer on some abdominal organ which, however, is not common in young horses; or of tuberculosis—this is most likely the cause and is incurable. There are other possible causes.

"J. H. N." asks cure for 12-year-old mare which crib bites and sucks wind, even during feeding.

Reply—A mare 12 years old with such a well-established habit cannot be cured. If there are others in the stable they may also take up the habit in imitation. A padded strap, obtainable at any saddler's, put tightly round the neck will prevent the habit somewhat, and a dram of carbonate of ammonia in the feed once or twice daily will mitigate the severity of the symptoms somewhat.

"H. C. J.," Parilla, asks treatment for two sows, one of which has become stiff in legs like a foundered horse, and the other paralysed in hind quarters.

Reply—The stiff one has probably had an attack of pleurisy, or the stiffness is caused by worms in the muscles. The paralysis of the second is most probably due to worms. Give both of them 10 drops of tincture nux vomica in a little milk two or three times a day; also a teaspoonful of sulphur twice a day in their feed, which should be soft, sloppy, and green if possible. To relieve the constipation give them an enema of a tablespoonful of glycerine. Give charcoal or cinders regularly in the feed.

"A. B.," Kanmantoo, asks advice concerning sheep. When driven a short distance they drop and die, often without a kick. When opened no disease is found, and kidneys are completely covered with fat.

Reply—When lecturing at Kanmantoo, the Veterinary Lecturer referred to this sort of thing, and fancies that at *post mortem* water is found about the heart and inside the belly, though not mentioned. The disease somewhat resembles braxy, the germ which causes it being well known and common, but only active when the sheep are beginning to do well, as the *post mortem* shows. The remedy is to keep moving them every few days, so that the pastures do not become infected badly. If one is noticed to stagger, the eye vein should be cut and probably its life will be saved. If the sheep are used to a lick, or can be made so, sulphur at the rate of 1 dram per sheep per day added to it will be of use.

"C. M.," Ironbank, asks cure for corns on horses.

Reply—Yes; corns can be cured by paring out well and shoeing with tips or three-quarter shoe, missing over seat of corn. Keep constantly dressed with Stockholm tar. A cure takes from three to six months to effect.

"E. J. T.," Lameroo, asks treatment for mare suffering from stoppage of water.

Reply—(1) Rub flanks well; (2) backrake, remove dung from hinder bowel; (3) warm soapy enemas; (4) pass fingers into urinary passage; (5) drench with ½ pint gin, 25 drops essence peppermint, ½ pint water.

"J. K." had a colt, rising 2 years, which suffered from loss of appetite, moped about for a fortnight, and then died. The *post mortem* showed liver, etc., full of decay and matter, smelling badly.

Reply—The animal suffered and died from an abscess on the liver, probably brought about by what is usually termed "bastard strangles," the germs which cause the strangles swelling under the throat having escaped those glands but overcome those of the liver, which suffered in consequence. If this had been known during life, an ounce of hyposulphite of soda twice a day for a few days in a little bran would possibly have prolonged life, but it is doubtful if it would have saved the colt.

"R. C." asks how to remove warts on cows' teats.

Reply—Can generally be removed by dressing with castor oil one day and vinegar the next, till gone. If big enough, cut off and touch with red hot knitting needle or similar article. If not successful with above paint daily with tincture thuya.

HORTICULTURE.

(Replies supplied by Mr. G. QUINN, Horticultural Instructor).

"E. J. P.," Whyte-Yarcowie, forwards specimens of bush and fruit of tomato showing peculiar malformation of the plant and flower buds. The fruit was mottled and of an unsatisfactory flavor and appearance.

Reply—I can see no insect or fungus present on these tomato flowers or fruits to indicate that such an organism can be blamed for the malformation and injury. These specimens are not uncommon evidence of the presence of this defect in the tomato plant, in fact it is quite the reverse, and the explanation is as yet obscure as to why the floral organs should undergo such transformations as exhibited in those to hand. Why certain cells, which normally are grouped into the shapes characteristic of and possessing the functions of the reproductive organs should go awry and become merely thickened stems and foliage leaves is not, to my knowledge, freely understood, beyond that some stimulus, not as yet under human control, must operate upon them at a critical stage of their development. In horticultural circles such plants are termed "blind," and are rigidly discarded from use in further propagation of their kind.

"W. S.," Watervale, asks for information respecting the working over of old but healthy orange trees to new sorts by means of budding.

Reply—There are two common methods of working over mature orange trees, each of which has its advocates. The first consists of cutting the tree back to its main limbs and budding into selected young shoots which usually emerge from these arms. The tops of the old trees are generally cut away in early spring, about August or September, and the young shoots budded before the end of the year, say before Christmas. Sometimes the tops of these shoots may be removed and the buds forced into growth that same summer or autumn; but in a locality such as yours, I am afraid these late shoots from the inserted buds would not ripen sufficiently to withstand the frosts. In this case, the buds had better be left dormant by not removing the tops until the following spring. The second method consists of inserting the buds directly into the bark of the old limbs in spring time and binding them with waxed cotton bands. After the buds have "taken" the top of the limb is cut off a few inches above the buds in each, or it may be only cinctured by the complete removal of a band of bark ¼in. wide. This latter method permits a certain amount of sap circulation to the old top, which in turn, maintains the activities of the root system until the buds have grown and made enough foliage to take its place, when the top may then be cut off. This old top, in the interval, may also be justly valued as a shelter for the tender first growth from the buds. It is a very good plan to give the stems and stumps of limbs a thick coating of limewash to protect the bark from the sun, as the tree will not, as a rule, make enough foliage on the growth from the buds the first summer to adequately shade the old framework. The bark on these decapitated trees sunscalds much more readily than when they carry even a meagre amount of natural top. It may be mentioned incidentally, that when buds are inserted in young shoots they should be put in close down to the junction of the shoots with the parent limb, and as in the case of those inserted into old limbs, be put into the outer or under side. Further, all large wounds made in removing the tops of the limbs should be made in a sloping direction, preferably to the south, and smoothed over before receiving a coat of thick lead paint. If growth from the buds be slow, the white-washing and painting of wounds may be repeated the second season with advantage.

"E. M.," Port Pirie, asks:—(1) Why melons formed on plants and then wilted away; (2) whether stiff clay soil was suited to melons; (3) the best time to sow melons and beans; (4) how to keep fruit trees dwarf when grown in pots or tubs?

Reply—In respect to the non-setting of the fruits although flowers are freely produced, as you probably are aware, the flowers on melon plants consist each of a separate sex. That is, one flower contains the female organs (pistils) and the other the male (anthers), and it is necessary for the pollen from the male to come into contact with the pistil at the right stage in the development of the stigma or end portion before fertilisation of the ovules can take place. This right stage is outwardly revealed by the presence of a sticky surface on the ends of the pistil. If you examine the flowers on the melon plants you will usually find these two sexes grown on the one plant, and botanists call plants with this arrangement "monoecious"; but when all the flowers on a plant are of the one sex, such are called "dioecious" flowering. You can readily distinguish the male flowers from the female by the fact that usually the petals (the yellow envelope) are larger on the male, and below the whorl of yellow petals there is no thickening of the stem which, in the female flower, is really the embryo melon carrying the unfertilised ovules which, when fertilised by the pollen from the male flower, change into what we know as seeds. Now, without this takes place there will be no quickening of the plant cells which go to make up seeds and the pulp surrounding them, and in consequence of this the plant-forming sap is not concentrated about the young fruit, but is distributed into those channels which make for the growth of more stems and leaves. Hence, we see a plant which does not set fruit usually making greater growth. It may be in your case there were no male flowers, or not enough, or *vice versa*, the male flowers may have predominated. As you remark, however, in the case of your marrows, the fruits form, but wither away, the absence of male elements was probably blamable. There is another factor, and that is the arrival of the right condition of the pollen and stigma at the proper day and time to enable them to unite, and if insects be at hand to carry the pollen to the pistil. Generally, in nature, bees and other insects effect the necessary fertilisation, but it is possible for them to be scarce, more especially early in the season. In such a case where a small number of plants is being grown it is not only possible, but even simply done, and proves a more interesting experiment for the grower to cross fertilise the flowers artificially. This is done as follows :—When the pistils are sticky, and the male flowers are available, select a time about midday when the flowers are free of dew or rain, and taking a small glass bowl, smooth inside, hold it under the male flowers, and if the pollen is ripe the flower on being tapped with a stick will shed its pollen into the bowl if held close beneath. Then with a camel's hair brush, such as school children use in tinting, convey a little pollen on to each sticky pistil by gently brushing it on. The pollen will adhere to the brush more readily if the breath be exhaled quickly into the hair before placing it in contact with the grains. If you wish to secure pure seed after pollenating the female flowers, cover them with a hood of fine muslin gathered and tied around the stem, but not tightly enough to stop growth. This is worth doing to your first batch of flowers, as these produce the plumpest and best seeds if the melons get a fair chance to grow. It is a very good plan to stop the points of the shoots carrying the blossoms by pinching out the terminal buds when the fertilisation is performed. (2) In respect to your soil, it is not calculated, in the condition you describe, to produce melons. All these plants like plenty of organic matter in the soil, and the best way to supply this is to dig in all the stable manure you can get. If it is not well rotted, dig it in to decompose during the winter and grow a crop of cabbage or turnips on the spot. Then, when the spring arrives, dig the ground well again, and in the spots where you propose to sow the melons, break the soil 18in. deep for a space of about 3ft. square and work into each about half a wheelbarrowful of well rotted stable manure. It is possible to get a second crop of fruits or marrows and trombones, in fact, these are more abundant than the first if the autumn be prolonged. (3) It is not much use sowing the seeds of heat-loving plants such as melons, maize, runner or French beans outdoors here until the ground temperature begins to permanently rise. Generally, this is about September or October in South Australia. (4) In respect to how to dwarf fruit trees so as to grow them in pots or tubs, the method usually adopted is to lift them out of the soil each winter and prune back the stronger roots as well as the tops. Trees grown in this manner must be fed with good soil, given in winter when repotting, or liquid manure applied during the growing season, otherwise they become too stunted. It is surprising what can be done with hardy plants carefully handled in this manner; but, of course, it is not a commercial proposition in this country.

DESTROYING MALLEE SHOOTS.

"F. W. B.," Karoonda, asks—(1) What is the best time of the year to cut mallee shoots? (2) In cutting them is it better to cut right down or slash only about two-thirds off? (3) Does the continual slashing finally kill the shoots, and what is the average period taken to kill same?

The questions were referred to Mr. L. S. Davie, manager of the Experimental Farm, Veitch's Well, who replies:—(1) The greatest check to mallee shoots is given if they are cut between harvest and seeding. If this is done in January, or early in February, the shoots may be fire raked, but if carried out later they would have to be horse raked and burnt in the rows. It is necessary to burn the shoots if cut before seeding, or otherwise they will block the implements, and afterwards make it impossible to seed evenly. The above method is preferable to any other on fallow, but if stubble land is sown a good fire raking will save three-quarters of the root cutting, and in that case there is a great advantage in leaving until after seeding; the dead shoots are knocked off by the plough. It is necessary to have the fire raking finished before the end of February to obtain good results. (2) If shoots are cut with a slasher, best results are obtained by cutting off about two-thirds of each shoot; this results in weak growths from the bottom portions instead of fresh shoots growing from the stump. By using a mattock and knocking the butt of the shoot out of the root a much greater number are destroyed in cutting than by using a slasher. (3) Continual slashing alone would not kill all the shoots in ten years, and it would not kill many at all unless done at least three times a year. The scrub farmer must have a fire rake, and, for the first four or five years the most important work he has to do is to get a stubble burn in the hottest part of the summer. With a stubble burn each year of crop—two crops in succession and then fallowing—burning 90 per cent. of the shoots each time, the land will be practically clear of shoots after the third burning. The length of time it takes to clear land of shoots depends altogether on the stubble burns, according as they are good or bad.

THE SHEEP LOUSE.

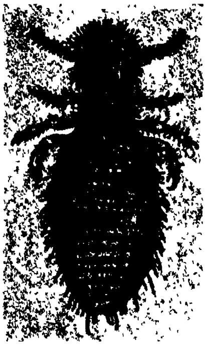
(*Trichodectes spherocephalus*)

(By T. H. Williams, Chief Inspector of Stock.)

Unfortunately the sheep louse has been discovered by the Stock Inspectors in almost every part of the State south from Melrose. They were introduced into South Australia on Lincoln sheep imported from England about 30 years ago, and were first discovered on rams at Mount Gambier by Mr. C. J. Valentine, the ex-Chief Inspector of Stock. As Linclon rams spread over the State, so the parasite spread. Many sheep authorities contended that Merino sheep would not become infested, but this has proved a fallacy, as they have been found on every breed of sheep, the Merino being the breed to suffer the greatest loss in wool and condition. The writer has seen infested Merino sheep, which had been neglected for a few months, become practically denuded of the wool on their sides as the result of biting and rubbing to relieve the constant irritation caused by the bites of the parasites.

The Parasite.

The parasite is not bred by poverty, as many fallaciously assert. There are males and females, and the life cycle is completed as the result of the latter depositing her fertile egg in the yolk about the roots of the wool, where they soon hatch out, and increase the sufferings of their unfortunate hosts by sucking blood, and in their turn becoming breeders. The louse, which is a greyish pink, is about the 30th of an inch in length, and lies close to the skin. The accompanying cut—by Professor Gilruth—will give the observer an idea of the appearance of the parasite when highly magnified.



Common Sheep Louse. (*Trichodectes spherocephalus*)—Gilruth.

HEAVY ANNUAL LOSS.

The annual loss to the national wealth which has resulted through the presence of this destructive parasite has been immense; far greater, in fact, than that caused by the sheep tick—an intimate associate which assists in worrying the host. Reference to a photograph of a lousy Shropshire ram should convince sheepowners of the importance of seeing that their sheep are kept free of such a pest. The ram was badly infested.

HOW THE PARASITES ARE SPREAD.

Lincoln, Shropshire, and Dorset Horn rams have been the means of spreading lice everywhere they have been taken. Ewes become infested at mating time, and are carrying a full supply when their lambs appear. The parasite evinces a particular liking for lambs, and will speedily multiply on them, reducing their condition and the owner's profits.

A LOUSY SHROPSHIRE RAM

RAMS.

Owners buying rams—more particularly of the long wool varieties—will do well to dip them before putting them with the ewes.

DIPPING.

The only known remedy for lice is to dip the infested sheep in some of the best known poisonous powder dips, and as the eggs are likely to escape destruction in the first dipping, a careful examination should be made in a few weeks, when a second dipping may be advisable. New Zealand authorities assert that sheep need to be dipped twice to thoroughly cleanse them.

THE LEGAL SIDE.

The legal side of the question is set out in the article on Sheep Tick which appeared in the April number of the *Journal.*

THE WOOL INDUSTRY.

COMBING AND CLOTHING.

By HENSHAW JACKSON, Wool Instructor, School of Mines and Industries.

A recent query from a woolgrower respecting the definition of clothing and combing wools opens up a very interesting question, and one that, so far as I am aware, has not been previously discussed or explained outside books of a technical nature. The inquiry referred to indicates that the questioner wished to be enlightened as to what constitutes a combing or clothing wool sheep, probably with a view of entering his animals in either class at a show. Whether it is correct to use the terms "combing" and "clothing" in this connection is open to argument, and might be to some extent misleading. It will, perhaps, prove to be the best way to confine ourselves to the terms strong, medium, and fine wool in regard to sheep, leaving other terms where they properly belong, viz., description of shorn wool for the guidance of those concerned in cataloguing wool for sale who understand certain words in a technical sense, and value them accordingly.

The full application of the words "combing" and "clothing" marks the division of the manufacturing section of the wool industry into its two component parts, termed "worsted" and "woollen" trades respectively; combing wools being employed in the former and clothing wools in the latter. The properties which render wool suitable for either branch of manufacture are in some respects similar; but each description possesses other characteristics peculiarly adapted for different processes of manipulation that make them distinctive with regard to their fabrication into worsted or woollen yarn.

It is entirely in the construction of the yarn or thread that the difference lies, and not in the cloth; for while it is possible to build up a fabric composed of worsted and woollen threads in warp and weft respectively, a single thread cannot be made from a sliver of combed or carded wool that combines the characteristics of each in its own body.

The requirements for a combing wool, properly so called, are uniformity of length and soundness of staple combined with the greatest possible fineness. Imbrications, or crimps on the surface of the fibre, are valuable, not from a milling or felting point of view, but because their presence allows the least possible number of fibres to adhere strongly together when twisted into a thread, and so enables the extreme length to be spun out of any given weight or quality of combed wool. A clothing wool, on the other hand, to fulfil all that is required of it should be shorter and softer than a combing, with equal or greater fineness and a clear white color, and display a marked crimpy formation in very short waves over the surface, indicative of the maximum number of serrations of the fibre. These latter are, in this case, of the utmost value in milling or felting, which is one of the chief processes in the finishing of a woollen fabric, the dull appearance of which, in comparison to worsted cloth is due to the innumerable small serrations breaking up the reflected light.

Strength, or more correctly, soundness, and elasticity are two properties that each description of the staple should possess in common, for upon them depends the wearing capacity of the cloth.

"TOPS."

The mechanical processes undergone by combing and clothing wools in their transformation from a mass of fleecy fibres into what are technically known as "tops" are quite at variance with each other, and a short description may prove interesting.

Combing is a term sufficiently explanatory of itself to enable us to mentally grasp what happens to the fibre in this operation, which is neither more nor less, practically speaking, than separating by means of teeth set comb fashion the short fibres from the long, leaving the latter lying parallel and straight their whole length, ready to be spun into a yarn of smooth hard surface that is extremely wear resisting. The short fibres or "noils" that are combed out—according to the translation of the term, which is dialect—being, from a worsted standpoint, a waste product, are afterwards used in woollen spinning where length is relatively unimportant.

The term "clothing," unlike "combing," does not convey much information regarding the after handling of this type of wool, the first mechanical manufacturing treatment of which, after teasing or willowing, is called carding. This process is infinitely simpler than combing, and may be termed a complete opening and breaking up of the natural or artificial arrangements of the fibres in order to present them in a perfectly loose and open condition, again to be crossed and blended together with mechanical nicety in their passage over the carding engine, so that they are thoroughly intermingled, long and short indiscriminately, in one common and uniform system. The short fibres being retained allow of the peculiar feathery appearance of woollen yarn in comparison with worsted, and contribute in no small degree to the felting process by gripping and interlocking with each other when being milled or fulled.

Generally speaking, it may be said that Australian Merino wool possesses very largely the qualities of softness and fineness requisite for the woollen trade, and were it not for the rapid strides made in perfecting combing machinery which enabled manufacturers to produce a superfine worsted, the larger proportion of our clip to-day would be utilised in the woollen industry.

From the foregoing it may be gathered that combing and clothing are purely technical terms used more nearly in connection with wool manufacture than wool growing; but sheepowners are concerned in them so far as seeing that in the " get-up " or classing of their wools for market they secure the services of someone who has an intelligent conception of the differences and can put a clip together accordingly.

Wheat Stacks Port Wakefield.

MENDEL'S LAWS EXPLAINED.

The application of Mendel's laws to stock-breeding are explained by Professor James Wilson in *Hoad's Dairyman.*

To get a first glance at Mendelism we shall take one of the simplest cases. The Shorthorn breed of cattle originated in the North-East of England by crossing the red and red-and-white cattle, which had come over from Holland three or four centuries ago, with a white race which had been in England, in all probability, since the time of the Romans.

The first cross produced roans. This color has been a favorite for more than a century, and breeders have all along hoped that by breeding with roans only, and especially with roans descended from roans for several generations, they would eventually produce roans that would breed true. But they have not been able to do so.

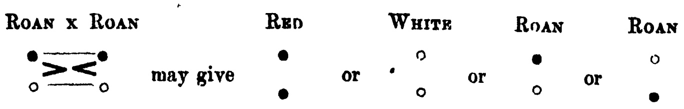
Roans bred with roans continue to throw whites and reds, as well as roans, and they will do so for ever. The numbers of whites and reds thrown are, on the average, one each to every two roans. At the same time, when roans are bred with whites half the calves are roan and the other half white, while when bred with reds half their calves are roan and the other half red.

THE MELTING POT.

Mendel's hypothesis explains these phenomena. Mendel himself really worked with plants, but we can transfer his reasoning to animals He argued that an animal must be indebted to both its parents, and that the thing which is going to determine its future in regard to any one of its points or "characters" must be duplex. He argued that when animals breed they cast replicas or duplicates of their own determinants into the melting pot of fertilisation, that the young takes a half from each parental replica and puts the two halves together to make a whole. This can be made clearer by a diagram.

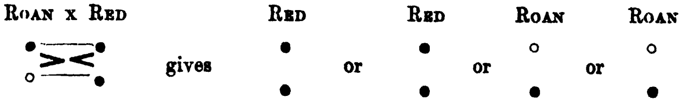
A red Shorthorn carries a determinant for redness, which we can represent by two small filled circles, thus : $\substack{\bullet \\ \bullet}$ A white Shorthorn carries another for whiteness, which we can represent in the same way by two small unfilled circles, thus : $\substack{\circ \\ \circ}$ When a red Shorthorn and a white breed they cast replicas of their determinants into the melting pot ; and the calf, taking a half from each, starts off with a mixed determinant, thus : $\substack{\bullet \\ \circ}$ and, as we have said already, this calf is neither white nor red, but roan, a color produced by a more or less uneven mixture of red hairs and white.

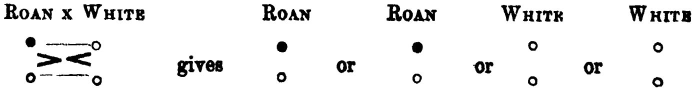
When a red Shorthorn and a white breed there is no possiblity of anything but a roan being produced, but when two roans breed together the calf may be any one of three colors. The red half determinant of one parent may meet the red of the other, then the calf will be red. The white of the one parent may meet the white of the other, and then the calf will be white ; or either half determinant in the one may meet the dissimilar one in the other, and then the calf will be roan. A diagram will show this :—



The chances are one in four for a red calf, one in four for a white, and two in four for a roan. This means that, given a sufficient number of cases, the calves of roan parents mated with roan must be red 25 per cent., white 25 per cent., and roan 50 per cent.

Similar diagrams will show what happens when roans are bred with reds and with whites. (In connection with this subject, it may be noted that red-and-whites are a variety of reds and breed similarly.)





Cases like the foregoing, in which the cross between two characters is somewhere intermediate between the parents, are the simplest, but they are by no means the most common.

A few of those already known might be mentioned, so that readers who are not familiar with Shorthorns might have a further chance of studying Mendelism through them.

White cattle and black have blue roan calves.

Cattle with a brown stripe along the back and a brown ring around the muzzle have brindle calves when bred with other colors.

Some large breeds of sheep have lambs of intermediate size when bred with smaller breeds ; as, for instance, Border Leicesters with Scotch Blackfaces or Cheviots.

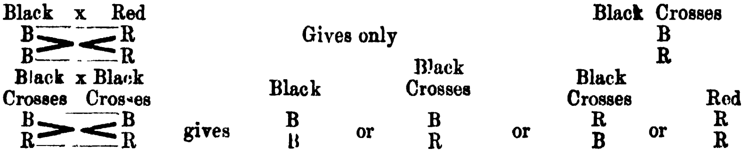
Some white-faced sheep have mottle-faced lambs when bred with black-faced sheep.

BLACK AND RED CROSSES.

Cases in which the cross is indistinguishable from one of the parents are more common. Unfortunately, they are slightly more complicated. The case we may use for illustration is the cross between the black cattle and the red. These crosses are all black, but a black indistinguishable from the black parent.

The Mendelian explanation is that these black crosses contain red, but that it is suppressed in the presence of black. They are crosses, just as are the roans, but with the difference that they cannot be told as such by the eye. That they contain red is clear from the fact that they throw reds when bred together. As a matter of fact, a quarter of such calves are red, another quarter are pure black like the black grandparent, while the remaining half are black crosses containing red.

A diagram will make this clear. We can use letters instead of circles :



Just as we did with the intermediate hybrids, we may mention a few other cases in which the crosses cannot be told from one of the parents.

HORNED AND POLLED.

Crosses between horned cattle and polled are polled. That is to say, the polled character is dominant to the horned.

The white face of the Hereford is dominant to the red or black face of other breeds.

The white fleece is dominant to the black fleece in sheep.

The round rump of Angus—and probably Hereford—cattle is dominant to the square rump of some other breeds.

The short legs of Dexter cattle are dominant to the long legs of the Kerries. Probably short legs in cattle as a whole are dominant to long legs.

Grey is dominant to all other colors in horses, and bay and brown are dominant to chestnut.

The five-toed foot of the Dorking is dominant to the four-toed foot of some other breeds of fowls.

DOMINANT AND RECESSIVE.

The two foregoing cases illustrate the ways in which characters are handed down from one generation to another. They may be summed up as follows :—

1. When the parents have differing characters their young are either obvious hybrids, intermediate between the parents so far as these characters are concerned, as in the case of white and red ; or,

2. Disguised hybrids, in which the character carried by one parent masks or obscures the character carried by the other, as in the case of black and red.

Mendel called the masking character the dominant, and the masked character recessive. These words should be remembered.

3. When both parents have the same characters pure—say white, or red, or black—that character is handed on pure to the young, who are white, or red, or black, as the case may be, just like their parents.

Having discussed the ways in which characters are inherited, how is this knowledge going to be useful to the farmer ?

Let us take first one of the cases we have already discussed. A stockbreeder has a herd of white cattle which he wishes to be turned into a red herd. Obviously his first step is to get a red bull to cross with his white cows. He finds all their progeny are intermediate hybrids—roans. His next step is to put a red bull again to the roan first-cross heifers. Half of the progeny of these will be red, while the other half will be roan. So if he continues the same process he will have a red herd so soon as he can afford to eliminate the last roan bred in the herd. If the same farmer could not find a second red bull he would have to mate a roan with his roan cows. Then a quarter of his calves would be red. The above is a case where the hybrid between the two characters is intermediate.

PROBLEMS EXPLAINED.

Let us now take the more difficult case where the hybrid is indistinguishable from one parent. A stockbreeder wishes his horned herd converted into a polled one. His first step is to get a polled bull to cross with his horned cows. Their progeny are all polled, but their power to have horns is merely suppressed. His next step is to use a polled bull again upon the hybrids. The progeny are all polled again, but, as we know, about half of them are hybrids again, and these cannot be distinguished by the eye. Now, there would be little difficulty in having polled calves in every generation if the stockbreeder could always get polled bulls that were pure for that character—that is, bulls in which both half-determinants are for hornlessness.

But if he wanted to use a polled bull bred in his own herd there might be a difficulty. The bull chosen might be either pure for hornlessness or he might be a hybrid, and there would be no way of telling until he had been bred from. If all his calves were hornless, then he is probably pure ; if some were horned, then he is undoubtedly impure. If the stockbreeder were absolutely dependent upon his own herd for a stock bull which would be sure to leave hornless calves, the only way of determining whether any of his bull calves are pure for hornlessness or not is to put them to horned heifers or cows and judge by the stock they produce. If all their calves from such cows are hornless, then the sire is pure for that character.

WHEAT REQUIREMENTS OF BRITISH MILLERS.

Mr. A. E. Humphries, Past President of the National Association of British and Irish Millers and Chairman of its Home-grown Wheat Committee, has written for the International Institute of Agriculture at Rome a valuable note on this subject. He remarks at the outset that the British flour-milling industry has, within the last thirty years, been subjected to revolutionary development in two principal directions, one economic and the other technological. At the beginning of that period, there were 10,000 mills in the United Kingdom producing flour; at the present time the number is less than 1,000, although the quantity of wheat ground per annum is now 80 per cent. greater than it was 30 years ago. Furthermore, one-third of the flour produced in the United Kingdom is made in about 30 large mills situated at seaports. The following facts are, according to Mr. Humphries, associated with these developments :—(*a*) The acreage under wheat in the United Kingdom has been greatly diminished, so that although the yield per acre has been increased substantially, the quantity of home-grown wheat, which 30 years ago was 36 per cent., is now nearly about 20 per cent. of the requirements; (*b*) the standards of excellence in flour have been raised, whereas the average quality of home-grown wheat has been lowered; (*c*) the milling system of gradual reduction by means of roller-mills has entirely superseded the use of millstones. The mills now existing are well equipped; (*d*) the development of new countries and the insufficiency of labor in most wheat-growing areas, have caused wheats to contain a substantial proportion of dirt, seeds, and other extraneous matter, so that elaborate and costly installations of wheat-cleaning machinery have been rendered necessary in British mills; (*e*) a system of "conditioning" has been elaborated whereby as a result of the skilful use of water, great improvements in the quality of flour, and great changes in the relative values of wheats have been made; and (*f*) under pressure of extreme competition, millers have to work on exceedingly small margins of profit per unit, and cannot afford to make mistakes in milling or tolerate irregularities in the quality of their manufactured goods.

Continuing, Mr. Humphries remarks :—"My next point is, that market value is not a true index of intrinsic worth. No person, or Government department, has set up in this country a standard whereby the intrinsic worth of a wheat or flour is to be judged, nor is any such action desirable, but certain characteristics in wheat are highly esteemed, and the trades concerned have come to regard the possession of certain qualities as a measure of intrinsic worth, principally because such wheats are generally in relatively small supply and usually realise maximum prices. A considerable amount of friction must be used in milling, but the millstone applied an unnecessary amount of friction in an unnecessarily severe way. The public demands a white or bright-colored bread, and in these days of good wheat-cleaning appliances the principal cause of dark bread is the presence in low-grade flours of an appreciable amount of bran powder. A wheat which is hard and possesses friable skin is more likely to be comminuted than a mellow one ; bran powder from a 'red' or brown wheat will darken the bread much more than the same percentage of bran powder from a 'white' or yellow wheat. So 40 years ago, in millstone days, a wheat which was mellow, white and strong, was considered excellent. Hence the high repute in which Dantzic, among foreign wheats, and Childham, among native varieties, were held in those days. But with the advent of roller-milling and imported flours made from wheats grown on the virgin lands of the United States and Canada, the older standards as to excellence of quality were changed, and we gradually came to recognise as specimens of high intrinsic worth the better grades of Canadian and United States spring wheats, hard friable 'red' skinned varieties, containing a high percentage of nitrogenous matter. Such wheats have for many years realised ordinarily the maximum prices of our markets, but not invariably. For we want other types of wheat as well, and supply and demand are far more influential elements in price-making than any current ideas as to intrinsic worth.

"The upshot of these considerations is, that British millers do not seek to impose any conditions as to the type or characteristics of the wheats offered them. All sorts and conditions of well-harvested wheat have a value on our markets, and can be sold therein. We do, however, attach great importance to various points of excellence, and believe that the plant breeder can in most, if not in all countries, provide varieties, in the highest degree suitable to the 'environments' existing there and to the commercial requirements of millers. British millers are to a greater extent than ever running their mills in a scientific way ; some have scientists on their staff. The idea that wheat is sacrosanct is passing away ; the newer conception is, that it is a fruit of the earth designed by Nature to be a seed and that in making it fit for use as human food the miller is right in obtaining not only the aid of the engineer, but of the chemist as well. With such aids he is the more disposed to make his own requirements subservient to the interests of growers. But he does ask that the arrangements made for marketing should in all countries be equitable. For instance if 'grading' be established in any country, the methods adopted should be uniform throughout the area concerned, and provision should be made for rectifyfng any substantial errors which are made in practice. He also asks that the glaring malpractices existing in connection with Russian grain shipments should cease. Such abuses in the long run will be highly unprofitable to the perpetrators, for buyers can take effective means of resenting them. Nevertheless as the recent history of the grain trade has shown, it would be better for all concerned that such evils should be rectified by the joint action of shippers, merchants, and receivers, with or without the co-operation of the Governments concerned."

In conclusion, Mr. Humphries recommends that the following points should be remembered by those wishing to sell wheats on British markets:—(1) Bulks should be uniform throughout, and the standard of quality, whatever it may be, should be maintained with a minimum deviation therefrom. (2) Wheats which contain the smallest percentage of dirt, rubbish, and other extraneous matter and which yield the highest percentage of good flour with the minimum of risk and trouble to the miller, are those which he prefers. Their virtues have a cash value. (3) Nothing should be done to hide or disguise any imperfections or faults of quality. A miller is more likely to buy wheat of poor quality at a reasonable price than run unknown risks by continuing to buy, except at a very low price, wheat whose real qualities he is unable to recognise or appraise. (4) Ordinarily the color of the bran is relatively unimportant, but preference should be given to white wheat. In this connection, it should be remembered that white wheats can possess great strength, and red wheats can be very weak, and that a dark-skinned wheat can yield a very white high-grade flour. Quality of endosperm is one Mendelian unit, color of skin is another. There is no inevitable correlation between them. (5) If on all other points they are of equal merit, wheats yielding a white flour are superior to those yielding a yellow or dark one. (6) A clear distinction should be drawn between wheats which appear to be hard, merely because the percentage of moisture they contain is low, and those which are really hard by nature, even when their moisture is raised to that of dry English wheat, say to 16 per cent. (7) Wheats, whether inherently hard or mellow, should always be of a "free milling" nature; in other words, it should be possible to obtain with the minimum of trouble and power the desired separation of husk from kernel. A mellow wheat which becomes "woolly" or a hard wheat which becomes "horny" when water is added before or during grinding, cannot be an ideal wheat. (8) The berry should be of average size, neither too short nor too long, neither too big nor too small. (9) Although bulks should contain no stones, dirt, seeds, or other extraneous matter, a low percentage of such impurities is not a great objection so long as their size and specific gravity differ substantially from those of wheat. Special care should be taken to exclude aromatic impurities, such as eucalyptus. (10) If the wheat come from a country where it is likely to suffer from the depredations of weevils, it should be of a kind which they do not readily attack, or it should be stored under conditions in which the risk of such damage can be minimised, or it should be exported soon after harvest. (11) If wheat come from a country where it is likely to suffer from an excess of rain or humidity at harvest time, those varieties should not be grown which are likely to sprout.

easily. (12) Durum wheats are not likely to realise maximum prices in British markets for flour purposes. The objections against them are much less now than they used to be, but in spite of all improvements in the methods of milling them, they are not so suitable for flour-making as wheats of the "ordinary" type. Some varieties of Durum are much superior to others, and if for agricultural reasons it is desirable to grow this type of wheat many varieties of it should be tested by growers, and those selected for extensive cultivation which suit the producer and are least objectionable to the miller. (13) Wheats which require different methods of cleaning and conditioning as part of the milling process, should neither be grown together nor mixed together before that stage of preparation has been passed. If that recommendation be not observed, the miller cannot develop or utilise to the utmost advantage the potentialities of the wheats so mixed, and cannot be expected to pay maximum prices for them. Therefore, an inherently hard wheat should not be mixed for sale with a naturally mellow one, if the best commercial returns are to be obtained by the producer. Furthermore, as white bran is not infrequently worth more than red, it is undesirable to grow together or mix before shipment white and red wheats. (14) Nondescript wheats are not of high value. If a wheat be really strong and poor in other respects, or if it yield flour of practically good color or flavor and on other points be of poor quality, its one great merit recommends it to buyers, whereas wheats of no outstanding merit on any point are merely "padding" and have no particular value. They can be sold, but at a low price.—*Indian Trade Journal.*

Shipping Wheat.

ANALYSES OF FERTILISERS.

The following are results of analyses made by the Government Analyst (Mr. W. A. Hargreaves, M.A.) of samples of fertilisers taken by inspectors under the Fertilisers Act since the beginning of the present year:—

Name of Firm and Fertiliser.	Phosphate.						Total Phosphoric Acid, calculated as Tricalcic Phosphate	Nitrogen.		Potash.	
	Water Soluble.		Citrate Soluble.		Acid Soluble.						
	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.
	%	%	%	%	%	%	%	%	%	%	%
Adelaide Chemical & Fertisisers Co., Ltd.—											
Guano super.	27·00	27·40	3·00	5·10	6·00	5·90	—	—	—		—
Super. B	16·00	18·00	14·00	19·20	8·00	5·10	—	—	—	—	—
Mineral super.	36·00	40·90	—	—	—	—	—	—	—	—	—
S.A. super.	30·00	37·30	—	—	—	—	—	—	—	—	—
Sulphate of potash, ex *Elbing*	—	—	—	—	—	—	—	—	—	52·00	52·16
Bell & Co., James—											
Muriate of potash, ex *Linden*	—	—	—	—	—	—	—	—	—	60·00	60·30
Crompton & Son—											
Pure bonedust	—	—	—	—	42·67	45·30	—	3·80	4·40	—	—
No. 1 fertiliser	—	—	—	—	10·00	14·40	—	3·30	4·00	—	—
Elder, Smith, & Co., Ltd.—											
Lawe's super., ex *Inverlyon*	36·00	39·10	—	—	—	—	—	—	—	—	—
United alkali super., *Edmund Rostand*	36·00	37·10	—	—	—	—	—	—	—	—	—
Hackett, E. & W.—											
Sulphate of potash, ex *Annaberg*	—	—	—	—	—	—	—	—	—	51·00	53·32
Bonedust (Adelaide Chemical Co.)	—	—	—	—	43·00	45·50	—	3·25	4·10	—	—
Bone super. " " "	15·00	17·40	15·00	16·10	6·00	5·00	—	1·60	1·90	—	—
O.K. bone dust (Crompton & Son.)	—	—	—	—	42·67	42·90	—	3·80	4·80	—	—
Sulphate of ammonia (S.A. Gas Co.)	—	—	—	—	—	—	—	20·00	21·00	—	—
United alkali super. (Elder, Smith, & Co.)	36·00	37·90	—	—	—	—	—	—	—	—	—

Hasell, A. H.—											
Jap super., ex *Oswestry*	37·00	40·80	—	—	—	—	—	—	—	—	—
Silbert, Sharp, & Bishop, Ltd.—											
Special bone manure (Mount Lyell Co.)	—	—	—	—	30·00	34·10	—	2·50	2·60	—	—
No. 1 potato manure (Adelaide Chemical Co)	20·00	17·50	10·00	12·10	5·00	5·00	34·60	1·50	1·20	4·50	6·90
Special bone manure " " "	—	—	—	—	17·50	25·30	—	2·40	2·50	—	—
Bone super. " " "	15·00	12·30	15·00	19·10	6·00	5·00	—	1·60	1·60	—	—
Bonedust " " "	—	—	—	—	43·00	45·40	—	3·25	3·90	—	—
Sulphate of ammonia " " "	—	—	—	—	—	—	—	20·00	20·10	—	—
S.A. Fertilisers Co., Ltd.—											
No. 1 super.	36·00	38·00	—	—	—	—	—	—	—	—	—
No. 1 super.	36·00	37·50	—	—	—	—	—	—	—	—	—
No. 2 super.	30·00	29·6	—	—	—	—	—	—	—	—	—
Wallaroo—Mt. Lyell Fertilisers Co., Ltd.—											
Guano super.	27·00	30·4	3·00	5·8	6·00	5·5	—	—	—	—	—
Guano super.	27·00	31·10	3·00	3·30	6·00	6·10	—	—	—	—	—
Standard super.	36·00	39·10	—	—	—	—	—	—	—	—	—
Adelaide super.	30·00	38·20	—	—	—	—	—	—	—	—	—
Government Produce Department—											
P.E.D. blood manure	—	—	—	—	—	—	—	12·00	11·9	—	—

Geo. Quinn, Inspector of Fertilisers.

IMPORTS AND EXPORTS OF FRUIT, PLANTS, ETC.

During the month of February, 1914, 927bush. of fresh fruit, 10,384bush. of bananas, 106 bags of potatoes, 8 bags of garlic, and 59 packages of seeds, bulbs, and plants, &c., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these, 1,132bush. of bananas and 9bush. of pines were destroyed (over-ripe). Under the Federal Commerce Act, 7,531bush. of fresh fruits, 1,736pkgs. of dried fruit, 60pkgs. of preserved fruit, 102pkgs. of honey, and 13 bags of onions were exported to oversea markets during the same period. These were distributed as follows:—For London, 709 cases of apples, 25 cases of pears, 102pkgs. of honey, 1,336 cases of dried fruit; for Germany, 6,317 cases of apples, 323 cases of pears, 25 cases of grapes; for New Zealand, 13 bags of onions, 325 cases dried fruit, 132 cases grapes; for India and East, 60pkgs. of preserved fruit; for South Africa, 75pkgs. of dried apricots. Under the Federal Quarantine Act, 849pkgs. of seeds, bulbs, plants, nuts, &c., were examined and admitted from oversea markets.

During March, 554bush. of fresh fruit, 6,738bush. of bananas, 3,093 bags of potatoes, 29 bags of onions, 31 bags of beans, and 68pkgs. of seeds, bulbs, and plants, &c., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these, 116bush. of bananas were destroyed (over-ripe). Under the Federal Commerce Act, 58,597bush. of fresh fruit and 11pkgs. of seeds were exported to oversea markets during the same period. These were distributed as follows:—For London, 19,338 cases of apples, 364 cases of pears, and 187 cases of grapes; for Germany, 34,362 cases of apples, 2,861 cases of pears; for New Zealand, 232 cases grapes, 11pkgs. of seeds; for Tahiti, 5 cases of apples and 2 cases pears; for India and East, 1,196 cases of apples. Under the Federal Quarantine Act, 937pkgs. of seeds, bulbs, plants, &c., were examined and admitted from oversea markets.

During April, 816bush. of fresh fruits, 9,940bush. of bananas, 4,812 bags of potatoes, 226 bags of onions, and 81pkgs. of seeds, bulbs, plants, &c., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these, 414bush. of bananas were destroyed (over-ripe) and 474 cases of bananas were fumigated. Under the Federal Commerce Act, 48,436 cases of fresh fruits, 3,546 cases of dried fruit, 56pkgs. of preserved fruit, 3 cases of jams, and 5pkgs. of seeds were exported to oversea markets during the same period. These were distributed as follows:—For London, 23,381 cases of apples, 1,261 cases of pears, 22 cases quinces, 60 cases of grapes, 1 case of peaches, 100pkgs. of Sultanas, and 1,275 cases of dried apricots; for Germany, 19,854 cases of apples, 717 cases of pears, 44 cases of grapes, and 2 cases of jam; for New Zealand, 72 cases of grapes, 35pkgs. of preserved fruit, 150 cases of dried fruit, and 5pkgs. of seeds; for South Africa, 920 cases of dried fruits; for India, 2,879 cases of apples, 145 cases of grapes, 21pkgs. of preserved fruit, and 1 case of jam; for British Columbia, 1,101 cases of dried fruit. Under the Federal Quarantine Act, 2,946pkgs. of seeds, plants, bulbs, nuts, &c., were examined and admitted from oversea markets.

POULTRY NOTES.

By D. F. Laurie, Poultry Expert and Lecturer.

OPERATIONS FOR APRIL.

Incubation.

A large number of breeders have hatched chickens which are doing well. These breeders will continue incubation throughout autumn, winter, and early spring. Others have not yet mated their stock and will not commence hatching operations for some time. Among poultry fanciers and those who, as a rule, hatch from 50 to 200 chickens, the practice is to defer incubation until August for heavy breeds and September for light breeds.

When to Hatch.

The question is often put to me—When is the time to hatch ? The answer is as follows :—*Turkeys,* as a rule, do not lay until July or August, but from that time until December the eggs may be set. *Geese* lay most of their eggs in August or September, and whenever they do so the geese may be encouraged to sit. *Ducks.*—With heavy laying strains one may have fertile eggs during a long period. The demand for out of season ducklings is not very good—still there is a chance of profitable work. Very early spring ducklings are in demand about the time of early green peas. To get these early ducklings May, June, and July hatching must be resorted to. For bulk hatching and for Christmas and January markets September, October, and November are the months. The best ducklings are Pekin or Pekin cross. Indian Runners are good layers ; and of these, on account of its plumage, the white variety is to be recommended. Muscovy ducks are bred largely in New South Wales, and several breeders are taking them up here again. The cross between Pekin ducks and Muscovy drakes results in an excellent table-bird. These crossbreds are true hybrids and are sterile. The period of incubation in ordinary ducks is 28 days, in the Muscovy duck it is 35 days. This duck is a native of South America, and Muscovy (relating to Russia) is a misnomer. *Chickens.*—For profit, either for eggs or for table poultry, hatch from March to September and a few hatches in October. For laying competitions the end of September and well on into October there must be successive hatches so that a proper selection can be made. For show, as soon after August 1st as possible, so as to obtain the greatest development.

How to Hatch.

Eggs may be hatched naturally (under broody hens, ducks, or turkeys) or artificially in incubators. Nests should be made on the ground, but selected so as to guard against flooding. Line with dry grass or short straw and keep free of vermin. Do not place under the hen more eggs than she can properly accommodate. The hen should not be fed on the nest, water should be within reach, but she should be encouraged to leave the nest each day. Feed on grain (wheat, oats, maize). Artificial Incubation.—There are numerous good machines on the market. The Poultry Expert cannot undertake to recommend any particular make of incubator. Follow the makers' directions, which are issued for the particular style of incubator. If in doubt have your thermometer carefully tested. Select only fresh eggs, the produce of healthy, properly-fed breeding stock. Avoid all over-large or any undersized eggs. Reject all misshapen eggs or those the shells of which are cracked.

For egg production the eggs should be laid by tested hens, or those of excellent pedigree as layers. Table-bird breeding should be from the all-round or general purpose breeds. Some people are very fond of crossing. The progeny, it is true, are very often fine table birds, but that is their value—so much a pound. If, on the other hand, you breed pure Orpingtons, Rocks, or Wyandottes you will always find a good sale for the best of your surplus birds at fair prices—much above the price of table birds. These cost no more to breed and fatten than do the crossbred.

Disinfect Incubators.

All incubators should be, before using, scrubbed out with hot water, soap, and soda. When dry they may be disinfected with a 5 per cent. solution of formalin, and then well aired for a couple of days before starting. This is important in view of the fact that white diarrhœa and other diseases due to germs are somewhat prevalent. Formalin is cheap—it should be kept stored in a dark cupboard. Light decomposes it. Repeat process after each hatch.

The Brooders.

The brooders need similar treatment to that recommended for incubators. Do not overheat these. For a start, run at about 90 degrees, then gradually cool off. It is more important to see that the chickens are not allowed to huddle in the runs and contract chills. They should be driven gently into the brooder. Much of the losses are due to chills contracted in this way. One need only watch a hen with a young brood. At frequent intervals, especially on a cold day, she "camps," and the chicks "snuggle" under her and remain warm.

Cut Greenfood.

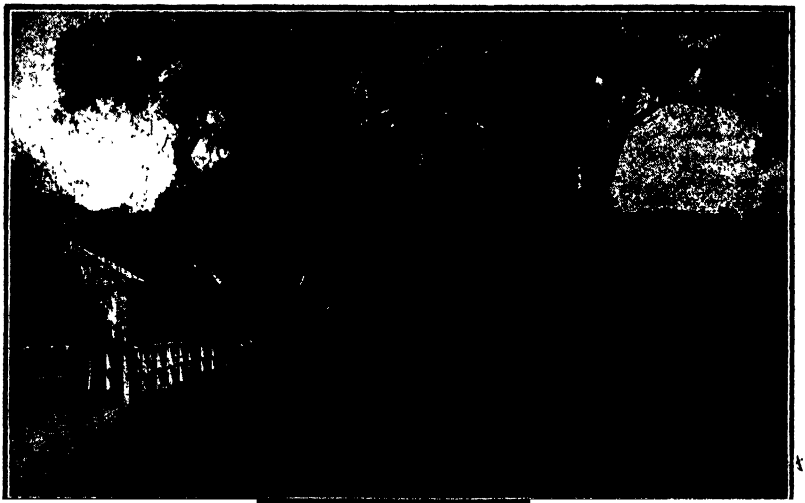
This is essential to all young feathered stock. It may consist of grass, lettuce, berseem, clover, kail, lucerne, &c. They will all consume large quantities. Chopped onion and garlic tops, or the tubers, may with great advantage be mixed with semi-dry mash, especially where turkeys are concerned.

Charcoal and other Grit.

This should be provided in hoppers. Chicken cracked grain mixtures are improved by the addition of a generous sprinkling of charcoal grit, sand, and gravel, and quartz grit. When dry mash is used there should always be an addition of charcoal.

Keep the Stock Growing.

If the stock is once checked the results are seldom satisfactory. "Little and often" is always a good maxim with young stock. Do not overfeed, but encourage them to scratch in litter and friable soil—they gain both exercise and food. Where earth worms abound thay should be dug up and fed to the chicks. They are greatly appreciated and cause fine growth. Change the ground as often as possible. Portable brooders are excellent. Move them to fresh ground as often as convenient.



A Suburban Road.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1914-15.

[Started April 1st, 1914, to terminate March 31st, 1915.]

Competitor.	Eggs Laid for Month ended April 30th.	Total Eggs Laid from April 1st, 1914, to April 30th, 1914.
SECTION I.—ANY BREED.—TEN PULLETS EACH PEN.		
White Leghorns.		
Hay, C., Prospect	69	
Indra Poultry Farm, Freeling	124	
Moritz Bros., Kalangadoo	114	
Sargenfri Poultry Yards, East Payneham	55	
Albion Poultry Yards, Magill	24	
Conyers, H., Morphettville Park	110	
Brackley Poultry Yards, Hectorville	46	
Schäfer, N. H., Strathalbyn	48	
Mason, A. E., Langhorne's Creek	101	
Robertson, D. J., Hamley Bridge	176	
Olive Poultry Farm, Freeling	129	
Bradley & McDonald, Moorabbin, Victoria	137	
Sunny Brae Poultry Farm, Islington	83	
Winter & Creswell, Port Pirie	100	
Kelvin Poultry Farm, Kelvin Grove, Brisbane	60	
Abby Poultry Yards, Willaston	74	
Broderick Bros., Gawler	110	
Gill, J. H., Cheltenham, Victoria	126	
Dunn, C. C., Cheltenham, Victoria	62	
Evans, H. A., Richmond, South Australia	78	
Ellimatta Poultry Yards, Torrensville	71	
Pettigrove, T. A., Northcote, Victoria	135	
Rice, J. E., Cottonville	94	
Purvis, W., Glanville	143	
South Yan Yean Poultry Farm, Doreen, Victoria	58	
Purvis, W., Glanville	161	
Pope, R. W., Heidelberg, Victoria	168	
Provis & Son, Tumby Bay	39	
Tockington Park Poultry Farm, Grange	82	
Woodhead, H., Torrensville	157	
Pimlott, A. V., Port Pirie South	71	
Excelsior Poultry Farm, Willunga	13	
Barron, Tom, Catforth, England	189	
Ogilvie, G. L., Hamley Bridge	43	
Ford Bros., Kensington Gardens	117	
Hughes, J. A., Willunga	49	
Broster, G., Mallala	108	
Roberts, C. A., Kersbrook	30	
Campbell, J. D., Barabba	65	
Rowe, J., Long Plain	96	
Messenger & Roberts, Albert Park	80	
Harris, J. G., Black Forest	108	
Black Orpingtons.		
Fisher, D., Drouin South, Victoria	139	
White Wyandottes.		
Barron, Tom, Catforth, England	151	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Score to Apıil 30th. Bird No.					
	1.	2.	3.	4.	5.	6.
SECTION III.—SINGLE TESTING.—LIGHT BREEDS.—SIX PULLETS EACH PEN.						
White Leghorns.						
Hay, C., Prospect	19	9	8	5	4	9
Harris, J. G., Black Forest	16	11	—	—	—	—
Glenelg River Poultry Farm, Mount Gambier	1	—	18	17	—	4
Schafer, N. H., Strathalbyn	—	—	—	—	—	—
Eckermann, W. P., Eudunda	8	—	—	—	10	—
Hagger, J. C., Orroroo	—	8	4	2	4	—
Glenelg River Poultry Farm, Mount Gambier	3	8	4	—	—	2
Koonoowarra, Enfield	5	2	4	1	9	5
Moritz Bros., Kalangadoo	6	4	8	4	4	5
Sargenfri Poultry Yards, East Payneham	4	—	1	1	7	8
Albion Poultry Yards, Magill	5	—	—	—	—	7
Glenelg River Poultry Farm, Mount Gambier	5	—	5	4	—	11
Conyers, H., Morphettville Park	7	10	14	2	16	8
Beadnall Bros., Gawler	10	13	14	5	10	19
Schafer, N. H., Strathalbyn	—	—	—	—	—	—
Robertson, D. J., Hamley Bridge	2	11	2	12	5	10
Russell, E. L., Salisbury	13	3	4	2	—	—
Bennett & Furze, Wright Street, City	—	2	2	—	—	—
Flannigan, J., Maylands	4	3	10	5	2	6
Miels, C. & H., Littlehampton	4	18	—	13	8	—
Sunny Brae Poultry Farm, Islington	8	5	—	12	—	11
Dunn, L. F., Keswick	17	—	14	—	—	10
Electricum Poultry Yards, Glenelg	15	13	10	—	—	6
Barkla, L. W., Gawler South	—	—	11	7	9	—
Purvis, W., Glanville	4	10	4	18	13	10
Harvey, A., Hamley Bridge	12	8	7	1	1	10
Brock, A. G., Hamley Bridge	—	5	—	—	3	13
Leonard, W. J., Port Pirie	—	—	—	—	—	—
Bertelsmeier, C. B., Clare	7	4	10	12	10	6
Messenger, A. J., Alberton	4	10	2	3	5	5
Bond, A. J., Clare	13	12	5	3	10	7
SECTION IV.—SINGLE TESTING.—GENERAL PURPOSE BREEDS.—SIX PULLETS EACH PEN.						
White Orpingtons.						
Koonoowarra, Enfield	10	16	—	8	7	—
Hocart, F. W., Clarence Park	—	—	—	—	—	—
Dawkins, W., Wayville	—	—	—	—	12	—
Perkins, C. W., Kensington Park	—	—	—	—	—	—
Black Orpingtons.						
Padman, J. E., Plympton	—	—	—	—	7	14
Kappler Bros., Marion	13	—	—	—	—	—
Haggar, J. C., Orroroo	—	—	—	—	—	—
Pope Bros. & Co., Hectorville	—	—	—	—	—	—
Greaves, W. E., Prospect	—	—	—	1	—	7
Pearson, W. S., Kingswood	—	—	—	—	—	2
Buff Orpingtons.						
Bennett, C. E., North Unley	—	—	—	—	—	—

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Score to April 30th. Bird No.					
	1.	2.	3.	4.	5.	6.
SECTION IV.—*Continued.*						
SILVER WYANDOTTES.						
Howie, T. B., Edwardstown	—	—	—	—	—	9
Kappler Bros., Marion	—	—	—	—	—	—
Dunn, L. F., Keswick	—	18	—	—	—	—
Perkins, C. W., Kensington Park	—	—	—	—	—	—
WHITE WYANDOTTES.						
Albion Poultry Yards, Magill	—	—	—	—	—	—
Gibson, F., Stepney	—	—	—	—	—	—
WHITE ROCKS.						
Padman, J. E., Plympton	—	—	—	—	—	11
Alberta Poultry Yards, Franklin	—	—	—	—	—	—
Koonoowarra, Enfield	—	4	—	—	—	—
PLYMOUTH ROCKS.						
Hagger, J. C., Orroroo	—	—	—	2	—	—
Greaves, W. E., Prospect	—	—	—	—	—	—
LANGSHANS.						
Palmer, W., Goodwood Park	—	—	—	—	—	—
INDIAN GAME.						
Coleman, C. B., Alberton	—	—	—	—	—	—
RHODE ISLAND REDS.						
Koonoowarra, Enfield	—	—	—	—	—	—

D. F. LAURIE, Poultry Expert and Lecturer

* * *

PARAFIELD EGG-LAYING COMPETITION.

REPORT FOR APRIL.

The competition began, as usual, on April 1st. Four sections were arranged for, but owing to poor entries Section 2 (Producers' Class) was abandoned. Section 1.—There were 51 entries. Each entry was of 10 pullets, instead of six as in previous tests. Section 3, Single Testing, Light Breeds.—There were 34 entries. Section 4, Single Testing, General Purpose Breeds.—There were 25 entries. The single testing of pullets is an innovation, the principle of which was approved some years ago but was deferred until the removal to Parafield had been effected. Excellent results are expected, with benefit to the industry. The birds arrived on and prior to March 31st. Several entries were not forthcoming.

Health.—Three entries were affected with chicken-pox, but soon recovered. The owners of these birds, in sending stock infected with chicken-pox, committed a breach of the law.

Weather.—The weather has been generally fine and temperatures moderate. Rain fell on eight days; the total recorded was 1·96 points.

Egg Production.—Moulting is general among the occupants of the pens in Section 3, and also in Section 4 to a less extent. The severe heat during show week had a bad effect upon the pullets in Section 4, as these were exhibited at the show. These are reasons for the somewhat poor returns of eggs. In addition, many of the competitors were immature and will not lay for some time.

Greenfood is abundant, and a supply throughout the winter is assured.

Visitors.—During the month 64 persons inspected the Poultry Station.

D. F. Laurie, Poultry Expert.

FRUIT SHIPMENTS.

The General Manager of the Government Produce Department (Mr. G. A. W. Pope) received a cable at the end of April from the Trade Commissioner in London (Major A. E. M. Norton, D.S.O.) giving the prices brought by fruit forwarded through the department for sale on behalf of various clients.

The shipment which left South Australia in the s.s. *Otranto* for London on the 6th March, 1914, consisted of 314 cases of apples. The prices obtained were as follows :—

No. of Cases.	Class.	Variety.	Average Price.
114	Apples	Jonathan	12/3 per case c.i.f.
—	"	American Mother	12/3 " "
100	"	Cleopatra	12/6 " "
50	"	Jonathan	9/- " "
—	"	Munroe's Favorite	9/- " "
—	"	Cleopatra	9/- " "
50	"	Cleopatra	13/- " "

The shipment which left here in the s.s. *Telamon* for London on the 28th February, 1914, consisted of 571 cases of apples and 89 cases of pears. The prices obtained were as follows :—

No. of Cases.	Class.	Variety.	Average Price.
150	Apples	Biffons	10/- per case, c.i f.
—	"	Worcestershire	10/- " "
—	"	Bedfords	10/- " "
100	"	Jonathans	13/- " "
210	"	Reinette du Canada	10/- " "
—	"	Winter Majetin	10/- " "
—	"	Ribstone Pippin	10/- " "
—	"	Bedfords	10/- " "
—	"	Early Rome	10/- " "
—	"	Raspberry Pippin	10/- " "

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, April 8th, there being present Messrs. F. Coleman (Vice-Chairman) presiding, C. J. Valentine, A. M. Dawkins, J. Miller, W. G. Auld, T. Williams, C. E. Birks, Col. J. Rowell, C.B., and G. G. Nicholls (Secretary).

Marine Fibre.—A letter was received from the manager of the Australasian Marine Fibres Company, Limited, indicating that a cloth suitable for the manufacture of corn sacks could be made from the fibre, but the making of the bag by hand, under local conditions, would be an obstacle to the commercial undertaking of such an industry.

Veterinary Surgeon for District.—The Secretary reported that the Minister of Agriculture was unable to entertain the idea of placing a Government Veterinary Surgeon in the Lucindale District, and the Branch had been informed accordingly.

Gratwicks "Beatsall."—A request was received from the Wilkawatt Branch that the Government should test the value of a preparation known as above, as a fertiliser for wheat. After consideration it was decided to ask the Minister to secure a report from the Inspector of Fertilisers.

Rail Freights on Oats and Barley.—The same Branch asked that the Railways Commissioner should be approached requesting that oats and barley should be carried at the same rate as wheat. As a comparison of the rates revealed but slight difference in the charges, especially on the long distances, *e.g.*, 100 miles, and having regard to the extra bulk of these grains, it was considered that no action would be warranted.

Life Members.—Messrs. J. P. Pontifex, of the Paskeville Branch, and S. H. Schinckel and A. Caldwell, of the Naracoorte Branch, were approved as life members of the Bureau in recognition of their long and effective service as members of that institution.

New Members.—The following gentlemen were approved as members of the Branches shown :—Berri—J. Norman, E. R. Moss ; Maitland—J. Tiddy, H. A. Wundersitz ; Meningie—E. Lawson ; Mount Bryan—T. Beckwith, A. E. McWaters, C. Collins ; Redhill—L. Pengilley ; Pine Forest—W. F. Hewett ; Borrika—J. Drue ; Port Pirie—C. Davidson ; Kadina—P. D. Anderson, E. H. White ; Pinnaroo—R. McCabe ; Yadnarie—J. Darby ; Northfield—A. Sandercock ; Kybybolite—H. Lambert ; Naracoorte—G. E. Kelly ; Parrakie—J. Parkinson, A. McArdle ; Penong—J. C. Stiggants ; Meadows—Rev. E. M. Ingamells, B.A. ; Clare—E. Dack ; Mount Barker—G. F. Paltridge, J. E. Liebelt ; Mount Gambier—D. McGillivary ; Minlaton—E. Jahne ; Mount Remarkable—J. C. Collins, F. A. Turner ; Mantung—J. E. Pearce, E. Tonkin, W. J. Carnell ; Kalangadoo—G. Bennett, jun. ; Saddleworth—J. Graham.

THE AGRICULTURAL BUREAU.

CONFERENCE OF SOUTH-EASTERN BRANCHES.

(Continued from page 974.)

AFTERNOON SESSION.

FODDER CROPS.

The Director of Agriculture (Professor W. Lowrie, M.A., B.Sc.) said the growing of fodder crops had been discussed in this district for the past 25 years, and in spite of all that had been said the extent to which the practice obtained at the present time was very limited. Even those forage crops grown in a few isolated instances were a matter of plots. If the matter were thoroughly gone into it would be found that over considerable areas in the South-East the most profitable practice was to make the growing of these crops the corner stone of their activities. The export trade was providing a more ready sale, not only for South-Eastern stock, but for that of all other parts of the Commonwealth, than had formerly been the case in the history of the export of meat. There was good reason, therefore, for farmers living in districts where such crops were practicable for them to test them.

In the South-East they had considerable areas of poor land (to say nothing of the very good land) which, even after they had put some work on it, would not prove such that they could profitably crop it. It was worth an effort to bring it into condition by the growing of forage crops. In New Zealand they had a lot of very thin country between the good land and the hills. This was worth from £4 to £11 per acre in the market. It was land that if they took a crop of oats off the grass would perish ; but it would yield forage crops, which accounted for the prices. The practice was to cultivate, sow, manure, and feed down, and so on. There was the opportunity of doing something to make up the country here that was only carrying sheep ; but the man who undertook to do it would err if he expected to get back in his first crop all he put into it. The good land in this district was not as clear as it was 20 years ago ; forage crops would help to rectify this. Rape could be tried with advantage. If this were put in, and fed down with sheep, it would soon clean " fat hen " out of the land. Crops of this kind would also put humus into the soil. Whilst potatoes at £3 per ton would be found more profitable than the crops he was advocating, they could not continue to grow that crop with any degree of satisfaction. It was necessary for them to change with something more than a cereal and grass, and have something that would raise the stock-carrying capacity of the farms in the future. Unless they laid themselves out to make the quality of the land in this way their returns would never be of the highest.

DRAINAGE AND MANURES.

From the point of view of farming in this district, the first consideration was to get rid of the water. This would make the manuring problem easier. There would be less demand for nitrogen when the waterlogged condition of the soils was remedied. It was an elementary principle, however, that in growing forage crops it was necessary to use more manure than was the case for growing cereals. Farmers did not like drawing a big cheque for artificial manures; nevertheless they would find that the extra 4s. per acre put out in this way was more than recovered by the extra returns. On the poorer lands they would have to be more careful, and get the position brought about more gradually; but on the better lands he had not the slightest doubt that it would pay them to be liberal with their dressings of artificial manures.

THE CROPS TO TRY.

Of the crops which would be suitable rape was one of the most important. Kale, white mustard, Italian rye grass, vetches, oats, and Cape barley had already been tried in the district. Rape was easily handled, a rapid grower, and a good cleaning crop, and one of the very best of the succulent fattening foods that was within their reach. Careful tests of feeding values had been made in other countries, and it had been shown that an acre of rape was equal in feeding value to 50bush. of barley. It was not a crop that one would put in if the rains came late in the autumn. In early seasons, with the rains in March, it was very useful, but if the season held off until May other crops would be more profitable. In the spring there was difficulty with blight. This could to some extent be contended with by feeding the crop down immediately the aphis were noticed. The rate of sowing for this crop should be 5lbs. per acre, and it was a good practice to sow from 2lbs. to 2½lbs. of white mustard with it. White mustard by itself scoured the stock and they would pass it, but if they put it in with rape they would find that when the lambs were being weaned they would take to it first. Kale was fitted to a wider range of conditions than rape. It could be sown in the spring; a bulk of summer forage would be secured from it, and if it were not fed down too hard it would also provide light winter and early spring feeding. At Roseworthy he had secured 26 tons of forage per acre from this crop, and it would do much better in this district; whilst it did not fatten the lambs so readily very fat lambs could be turned off it. Of the cereals, Cape barley was the one on which most people put the greatest value, but it did not stand so much grazing as Dunn oats sown early. It was objected that these oats did not stool well, and took too long coming, but they could be grazed harder

Cereals for greenfeed should be sown much more thickly than if they were required for grain; 2bush. of barley per acre should be used and 2cwts. of manure should be put under it. It had been said that the extra hundredweight of manure would increase the acidity of the soil, but in discussing the matter with chemists he had learned that the small weight put on would be so distributed over the ground that neither the chemists nor the plants could discover a trace of it.

ITALIAN RYE GRASS.

A good deal of attention had been paid to rye, and on the very poorest land this would be found one of the best means of recovering it. Men who had done well with potatoes at Mount Gambier would do well to put 3lbs. of Italian rye grass on the land, and they would be astonished at the results. Cape barley would perhaps carry from 10 to 15 sheep to the acre for five months. From analogy and from experience he would say that Italian rye grass would carry the same number for twice the time. The Italian rye grass was a great winter grower, and excellent for finishing off the lambs. It was essential to get the best seed, however, even if they paid 8s. per bushel for it. Sutton's Giant or Westernwolth's sub-variety should be secured.

CAREFUL CULTIVATION.

His object was to urge on landholders the importance of putting these crops in better than they had, and trying different times of seeding, in order that they might find for themselves the best methods. On their ordinary cropping land they would find that phosphatic manures alone would not be sufficient. They would have to put a little nitrogen into the soil as well. One way of doing this was by sowing peas, either for grain or as a forage crop. There was also the French vetch..

QUESTIONS.

In reply to questions the Director said barley would come in for feed before Italian rye grass, but the advantage was only very slight. In Canterbury he made a practice of sowing it on wheat stubbles in March. About the first week in August it would be about 4in. or 5in. high.

Mr. A. A. Sassanowsky said Italian rye grass could not be put in after potatoes, because they were not in until June.

Mr. J. H. Kilsby asked whether as good a cut of hay could be secured from Dunn oats after feeding down as was obtained from Algerian.

The Director of Agriculture said that whilst they would not perhaps give the same weight of hay the quantity of oats would be there. Italian rye grass would make very good hay.

Mr. D. Tucker (Kalangadoo) asked whether, as this grass was very fattening, it would rob the soil and weaken it for the following crops, The Director of Agriculture said wheat after this grass would not do well. Oats did not feel the influence of it in the same way, however.

Mr. T. H. Williams (Chetwynd) asked whther it was generally recognised that a crop of Italian rye grass came on slowly after kale. He had had difficulty in getting rid of kale stalks, and was troubled with thistles.

The Director would not expect the grass to do so well, but he had destroyed the stalks of the kale with the disc plough.

The difficulty with vetches was the harvesting of the crop and the cost of the seed. At the moment they were scarcely within the range of practicability on these accounts. There was no reason why they should not grow as well here as in other countries. The hairy vetch was perhaps better than the French vetch, and this would come in for use on the poor lands. White turnips were the best. In this country there was a tendency to feed the grass paddocks constantly. By sowing turnips one paddock could be allowed to rest whilst they were feeding them. In the case of peas, if they had a sufficiency of feed to keep the stock going, it was as well to allow the peas to remain until they were ripe.

PIGS.

The Dairy Expert (Mr. P. H. Suter) addressed the meeting on this subject The serious attention given to pig-raising in older countries had not been accorded this branch of industry in Australia, he said. Here there was no animal contributing so much directly to our food supply, nor was there any so badly housed. Indeed, in many places the pig had been looked upon as a scavenger, and only too often treated as the housewife's best sink. We had in this State some excellent animals, the fruits of money spent by breeders, who imported pigs at considerable cost; but there was room for improvement generally, not alone in the type of pig, but in the general management thereof, particularly in housing and feeding. To many, he said, a pig was just a pig, although it cost no more to keep a good one than a bad one. The remarkable fact about improved pigs was the readiness with which they fattened, and the shorter time they took to reach that stage demanded by the butcher. An illustration was given to show the difference in profits that might be expected from a good sow mated with a well-bred boar, and a bad sow mated with an ill-favored boar, assuming that each produced two litters in one year, thus—A good sow produced 20 bacon pigs, valued at £3 10s. per head, or £70 ; and feeding expenses, including £5 for keep of sow, and £35, for the feeding of progeny, left a profit of £30. The inferior sow produced 12 young pigs, worth £3 7s. 6d. per head, or £40 10s. ; and with £5 for maintenance of the dam, and £21 for the feeding of the young ones, the net profit was £14 10s.

The instability of markets was frequently blamed for the erratic interest taken in the subject. This might result from over-production, but more often was due in this State to the fact that heavy supplies were obtainable in the eastern States. It was also quite possible that prices obtainable were not so profitable when the price of foods, such as barley, peas, &c., were at high levels, or that pigs were marketed when either too light or too old and weighty for trade requirements.

The industry would continue to have its ups and downs just so long as we had no outside market. The only way to secure a sure and permanent market for pigs was through the systematic development of a few bacon and ham factories, not in the city, but in suitable country districts, where conditions were favorable for economical and proper feeding. Manufacturers could then guarantee uniformity of supplies, qualities, and flavor. This could be arranged when low values were likely. It had been done in America, and there was no reason why the example could not be followed here. A few years previously the Advisory Board of Agriculture expressed the opinion that action was desirable, and when asked for a report, the manager of the Produce Export Department said, and rightly so at that time, that it was practically impossible to secure a supply of pigs suitable for the export trade. Inquiries were made for 100 suitable pigs, likely to create a favorable impression in London; but they could not be obtained. Spasmodic trial shipments were subsequently made with varying results, and in one case, after all expenses were paid, the returns were just equal to those ruling locally; but at that time bacon and pork were at low values in London. Only recently the Yahl factory (Mount Gambier) had sent to the London Dairy and Bacon show a few sides of bacon that had to compete with the best English products, and whilst not successful in gaining prizes, it was creditable to find that they beat the New South Wales exhibit by five points. Yet when sold the price netted was approximately 6d. a pound, which was not nearly equal to present local values. Australian bacon suffered by contrast with the English on account of not being specially dressed to English custom, and the flavor did not compare with the English specially fed hogs. England's bill for imported pig products during the past year was approximately 25 to 26 million pounds, and with American consumption overtaking supplies there was a brighter outlook for Australia. Yet the number of pigs had not shown any appreciable increase for 14 years. In South Australia alone 14,000 fewer pigs passed through the Adelaide market in 1913 than was the case in 1912. Present values warranted the feeding of pigs at high pressure, especially now farmers were experiencing difficulty in obtaining remunerative values for produce such as barley, oats, potatoes, &c. The reverse practice should obtain when foodstuffs were at higher values, and pigs were cheap. Then it was justifiable to treat the pig as the consumer of coarse farm produce, steadily growing into a good frame as a store, to be subsequently fattened up upon concentrated foods.

FEEDING YOUNG PIGS.

Successful feeding of pigs provided one of the most difficult tasks of the farmer. If he pulled the litter through the first 24 hours after birth he had gone a long way towards successful rearing. Half of the losses among young pigs occurred soon after birth, for many were laid upon unless vigilance was exercised. A lot depended on the health of the sow prior to farrowing. Sows should not be too fat, but should not be allowed to get too low in condition, or they would not provide sufficient milk for their young, nor would the young be so vigorous. Consequently growth would be checked at a period when the piglets should acquire a habit of rapid growth. The sow should come in two weeks before farrowing. A good practice was to give her half a pint of castor oil in the food within a couple of days before farrowing. For a week before it was recommended giving her two bran mashes, and a couple of handfuls of bran in the food daily. Prior to this she should have been in a small grass, lucerne, or clover paddock, where she could have sufficient exercise to keep her in good health.

These simple precautions often obviated a vast amount of trouble, and reduced loss by assisting the sow to more readily deliver her young in a much better condition. Often when a sow experienced trouble one or two suckers were born much earlier than the remainder, and in the cold weather these contracted a chill and died, or the sow, being restless, rolled upon them. Further, a sow judiciously fed before farrowing had not the same inclination to devour her young. This habit was due to a depraved appetite. After farrowing was completed, the sow should be moderately fed during the first four days, especially if her udder were well flushed with milk, as the young ones might not take it away fast enough. As a rule she should be given a nice warm feed of milk and bran with a little pollard, but no grain, because it might cause constipation and affect her milk, and consequently the young. At all times a supply of charcoal with say a mixture of 25lbs. of lime and 1lb. of salt, or ½lb. of saltpetre, should be placed where sows could readily get it in their sties. The sties should admit sunlight, possess good drainage, be free from draughts, and have well-laid floors. If possible a small railing should be placed around the three sides, say 5in. or 6in. high, and 8in. from the walls. The young pigs could then get away safely from their mother when she laid down. The bedding, or straw, for farrowing sows should not be long, for invariably it was the cause of a death or two among the young suckers, owing to the ease with which they become embedded and consequently laid upon.

Wheaten straw was the best to use for bedding. The little pigs until about three weeks old did little else but sleep and drink. They should not be allowed to roam at large with the mother. When it was noticed that they had a disposition to do so it was time to give them a little drink on their own, for much depended upon getting them to learn to drink early. Milk which had had the chill taken off should be supplied in a shallow, clean tin trough, where the sow could not gain access to it. Care should be exercised to see that the suckers did not gorge themselves, or bowel trouble would occur, If anything were mixed with the milk, say at four weeks, a little barley meal, but not bran, was recommended. As they grew the pigs might have a little scalded pollard added. This prepared them for the critical period of weaning, which should take place at about eight weeks old. Young pigs rarely went wrong, and if they did, it was generally due to ill-judged feeding just before or after weaning. All male pigs should be emasculated at about three or four weeks old. If castrated say at six weeks to two months they invariably possessed a much thicker rind when made into bacon. With liberal feeding in the form of milk or whey with pollard, soaked, crushed barley, wheat, and greenfeed, the young pigs should have made good growth at eight weeks old, and were then well able to look after themselves. Should they scour at any time when sucking the sow the food of the latter should be changed. When weaned they should be fed at frequent intervals to minimise the loss of their mother's milk as much as possible.

FEEDING.

" The opportunity to make money out of pigs is," he continued, " to a large extent governed by methods of feeding—the general aim should be to supply at the least cost a ration producing the highest quality of pork or bacon. In years gone by the main object was to produce a pig of extra heavy weight, but what is now required is a younger and lighter pig for Australian use ; for pork, say, 80lbs. to 90lbs., and bacon 120lbs., dressed weight. The English market demands heavier pigs, say, from 160lbs. to 180lbs. The pig killing 120lbs. weight for bacon is the most economically fed. A young pig, if properly fed, will produce 1lb. of green pork out of 4lbs. of food, equal in food value to pollard, whilst a fully-matured pig may take from 6lbs. to 8lbs. to make the same gain of 1lb. in weight. Taking pollard at 1s. per bushel, or 0·6 of a penny a pound, when fed to a young pig the pork will cost less than 2½d. per pound, whereas the cost of adding weight to a pollard-fed mature pig is over 3½d. each pound.

Pigs may fairly be said to be the most economical meat producers of all farm stock, judged by the quantity of meat for the food consumed. The average weight of a sucker when born is 2½lbs., and from reliable records we find that under proper management they will make an increase in weight during the first week of almost 2lbs., equal to an increase of, say, 76 per cent. The percentage gain in weight for food consumed becomes less every week, until in the sixteenth or seventeenth week, the increase is not more than 6 per cent. There is a difference of opinion in the mind of feeders whether it is better to cook grain or simply to soak it. Soaking has proved to be the preferable method, being cheaper and handier. Exhaustive experiments have proved that on an average 505lbs. of cooked grain will produce 100lbs. of pork, whereas 476lbs., soaked, will give the same results. Another point of interest was proved, viz., that by feeding mixed grains a saving of at least 15 per cent. in the amount required to produce a pound of pork was effected.

The maintenance requirements of a pig have been set down at 2lbs. of food possessing the equivalent food value of 2lbs. pollard for every 100lbs. live weight, and it is only when they receive food in excess of this amount that they make increased weight and lay on flesh. Providing they are properly fed, then the more they can be encouraged to consume in 24 hours the quicker will they be fit for market. The feeder should never allow any excess over requirements to be left in the trough, feeding only just what they will clean up. It is not advisable when feeding to give it in too sloppy a condition, but more of the consistency of porridge—say three of milk, whey, or water to one of solids—pollard, barley, wheat, &c. A plentiful supply of good water should at all times be available for the pigs. When young growing pigs are out running on pastures do not cut off their supply of milk and grain, but give a little always, and finish them off in the sty with grain. If during the period between the sixth to the twelfth week of the life of the pig it is injudiciously fed and stunted it will become a poor doer, and no matter what subsequent treatment it may receive will not be so profitable.

Solid foodstuffs recommended are—Peas, beans, barley, oats, bran, pollard, rye, wheat; greenstuffs include lucerne, clover, peas, barley; roots comprise potatoes, mangels, swedes, artichokes, &c.; and liquids, skim milk, water, and whey. Peas provide a large percentage of protein or nitrogenous matter, and are consequently good for young growing pigs, and the production of lean bacon. If fed whole they are very palatable, but prove too wasteful, a large percentage passing through the system undigested. When crushed they are better. Pea meal, whilst a valuable food, must not be fed alone. It is difficult to digest, and is likely to sicken pigs. A good plan is to add a little ground oats with the peas. Beans, where they can be grown successfully, prove excellent food. They are rich in protein, and are thus valuable for enriching the ration. However, if fed in any considerable quantity they will result in producing what is known as a soft bacon; so for best results it is advisable to feed them with other grain.

Barley may with truth be described as the best of all grains for pigs, especially for the production of good bacon. This applies both for quantity and quality. Barley should always be crushed and soaked, and for young pigs should be mixed with pollard. Damaged wheat is also a valuable food for the production of good bacon, and gives better results when converted into pork than when sold as grain. It takes on an average 5lbs. of wheat to produce 1lb. of pork. Split or damaged wheat can at most times be turned over to a greater profit in this way. Rye has a lower feeding value than either wheat or barley. It will, however, produce an equal increase in weight of the pig, but the quality of the flesh is inferior, and therefore it is advisable to mix it with other grain. Where oats are largely used the husks should be removed by soaking in water. They are excellent food for feeding grown pigs, making good meat, but they have a slight disadvantage, being of rather too fibrous a nature for young pigs. A little crushed oats are best mixed with other foods. The famous York hams are supposed to owe much of their excellent flavor to the fact that the pigs are very largely fed upon oatmeal.

MILL AND DAIRY BY-PRODUCTS.

Pollard has at all times proved an excellent food when fed to pigs of all ages and for all purposes, but having the reputation of producing pork of rather a soft nature, for this reason it may be better fed with a little barley or damaged wheat. Pollard when fed with milk gives very satisfactory all-round results. Bran, although rich in protein content, must not be accepted as a pig fattener. It is an excellent milk producer, and for this reason is valuable food for a sow just before or after farrowing. It also has the effect of keeping the bowels in good order. Because of the high food value of separator milk, dairying and pig-raising must go hand in hand for best returns. By no means can pigs be so profitably turned into good baconers as where a liberal supply of skim milk is available. To obtain fullest value it must be fed in conjunction with any of the grains grown upon the farm. Whilst of considerable value as a food, whey is not equal to skim milk or butter milk, especially when fed to younger pigs. Again, it will not produce as good a quality of bacon unless it has other foods rich in protein content added to it. The bulk of this valuable food constituent is taken from the whole milk to form cheese. The feeding value of whey is really only half that of separator milk. In Denmark the results obtained from most exhaustive experiments proved that for feeding purposes 6lbs. of skim milk were equal to 12lbs. of whey or 1lb. of crushed barley. When feeding whey it is advisable to use, say, 3lbs. to 4lbs. with 1lb. of crushed barley meal or pollard. Pure butter milk to which no water has been added is of equal food value to skim milk. Farmers must not forget that this when obtained at factories almost always has a large quantity of water, possibly 30 per cent. to 50 per cent., added to it. Many instances could be given of considerable loss being occasioned where pigs were fed on watered buttermilk alone, a form of starvation, there being insufficient nutriment or solids present to satisfy the ordinary maintenance or body demands. Buttermilk, as taken from the factories when fed with grain or pollard, &c., to make up for any deficiency in nutriment will give good results.

GAIN IN LIVE WEIGHTS.

Taking it that the young pig when ready to wean weighs 26lbs. to 32lbs. live weight, at 10 weeks he should weigh 40lbs., and at six to seven months he should turn the scale at 150lbs. to 180lbs. live weight. The following will produce 1lb. extra weight of flesh, viz., 4½lbs. of soaked barley; or preferably 3·64lbs. of soaked barley with 5lbs. of separated milk, putting on the extra weight from 40lbs. to 180lbs. at the following cost, milk being free :—Ten and a half bushels of barley at 2s., £1 1s. Seventy gallons of separated milk would also be required. Assuming the young pigs cost the breeder at 10 weeks 19s., the total cost till ready for the knife would be £2. At present values the pig weighing 160lbs. live weight would realise £3 10s., leaving a profit of 30s. per pig. This gives a return of 4s. per bushel for barley and 9s. for any little labor connected with the feeding and skim milk. The mating of very young sows with the boar at six to seven months is not always advisable. A difference of opinion exists whether to mate at six, 10, or 15 months, but generally the 10 months is accepted as the better age. The young sow may be very restless or excited when farrowing owing to inexperience, and at times a shortness of milk supply will result. In this case remove the young, and when the sow finishes farrowing quietly place one or two little ones to her teats ; she will then generally respond and let down her milk, when all suckers may be put with her. Young and very aged sows should be fed three times daily when suckling a good litter, the food being of soft character, warm, and easily digested.

RETURN FOR VARIOUS RATIONS.

Pigs of from 60lbs. to 100lbs. live weight consume on an average 3·35lbs. of foods, say pollard, per day, and when at 100lbs. to 150lbs. of live weight, 4¾lbs. If pure buttermilk only is fed, the pig would require to consume 6galls. to obtain sufficient nutriment, whilst 9galls. of ordinary diluted buttermilk would be necessary if used as a substitute. Potatoes offer many advantages to pigkeepers when the price is low, like barley and oats, so that nothing better can be done than to feed them. They require to be fed in conjunction with grain, more specially with milk or whey. The best results are obtained by feeding 4lbs. of soaked grain, four of skimmed milk, and three of potatoes. In food value 4lbs. of potatoes are equivalent to 1lb. of barley or wheat as a food. Potatoes, although good when fed raw, are improved very much by pulping and cooking. They should always be cooked, and the water from the potatoes should not be used, as the tannin contained in it will coat the stomach, and prevent a free and natural secretion of the digestive fluids. When fed to young pigs the following rations will be required :—No 1—Cooked potatoes, 3lbs. ; skimmed milk, 10lbs. ; or No. 2—Cooked potatoes, 4lbs. ; buttermilk, 6lbs. ; barley, 1lb. Sugar beets are preferred by pigs to any other roots. It is not advisable to give them too freely, but they may form a fourth of the ration. Lucerne, tares, and clover are all valuable for grazing, or feeding a little in the sties, but grain must also be given. Molasses is sometimes given to pigs in small quantities, say 1lb. per day; its chief value is as an appetiser. Any kind of fruit may be fed, but it must be distinctly understood that grain must also be added. All pigs are the better for a run in a nice, handy, well-grassed paddock of lucerne.

EARLY MATURITY.

The secret of producing early pork is to give a liberal allowance of green feed. When fattening for bacon it is advisable to put pigs in the pen at, say, five months old. At this age, if judiciously fed, they will develop into nice-conditioned baconers at six to seven months, and weigh from 120lbs. to 130lbs. dressed. Porkers should weigh 70lbs, to 90lbs., and this weight can be produced at four or five months, according to breed and feeding. Danish breeders mix their grain as follows :—For pigs up to four months old.—Mixture—Eight parts of wheat, eight parts of barley, one part of oats. For pigs over four months.—Mixture—Fourteen parts barley, four parts wheat, one part oats. All the food is soaked, crushed, and green food is supplied at midday. For a sow producing two litters, each of eight suckers, a year, a farmer would require to provide the following amount of food to rear them :—Daily rations for sow carrying litter—Seven pounds to 8lbs. of grain, 1½galls. separated milk, 5lbs. of good green lucerne. It will take approximately 18bush. to 20bush. grain and 75galls. skimmed milk to rear each pig, inclusive of feeding to sow; to rear 16, 36bush. grain, 1,250galls. skimmed milk, and green feed.

FOOD RATIONS AND COST.

Daily rations for pigs, supplying all that is necessary for body development and fattening, with skimmed milk not charged up in the costs, includes :—No. 1—Daily rations from two to three months old—Six pounds skimmed milk, 1½lbs. of pollard, 1lb. barley. The month's total food amounts to 45lbs. of pollard, 30lbs. of barley, and 18galls. skimmed milk. Total cost, 3s. 5d. No. 2.—Daily ration from three to five months old—Two pounds wheat, 2lbs. barley, 6galls. skimmed milk. Total requirements for the two months (60 days), 120lbs. wheat at 3s. per bushel, 150lbs. barley at 1s. 10d., 36galls. skimmed milk. Total cost, 11s. 6d. From five to six months old a daily ration is recommended as follows :—Three pounds of skimmed milk, 2lbs. of wheat, 3½lbs. of barley. This would cost for the month—Wheat 3s., barley, 3s. 10d.; with total cost for the month's feeding, 6s. 10d. In the final month (sixth to seventh month) peas may be fed with the ration to top off. Where no peas are grown feed daily 1½lbs. of wheat, 5½lbs. barley. With wheat costing 2s. 3d., and barley 6s., the total cost for the month would be 8s. 3d. The total cost of food from weaning to marketing condition would be £1 10s., made up as follows :—Barley, 9bush. at 1s. 10d. on farm, 16s. 6d.; wheat, 3bush. 45lbs. at 3s. on farm, 11s. 3d.; pollard, 2¼bush. at 1s. on farm, 2s. 3d. Where potatoes are low in value or unsuitable for market, they may be fed with much success. A good ration for fattening a pig is 1gall. skimmed or butter milk, 4lbs. soaked barley, and 3lbs. cooked potatoes. A little green lucerne during the summer, or lucerne hay during winter, is an excellent food in conjunction with the rations mentioned, varying the quantity from 1lb, to 3lbs. daily, according to age.

STUDY MEAT AND FODDER MARKETS.

It has been shown that one can raise a properly cared for young pig from two months of age until ready for market, when 160lbs. live weight, at a cost of 30s. Such a pig would realise from 75s. to 85s., leaving a substantial profit. To dairymen, who can best raise pigs profitably on account of their having skimmed milk, it requires approximately 80galls. to feed the sow and raise each young pig. Therefore, one sow to every 8 cows kept should be a safe margin, or perhaps it would be better to say one cow to every sucker. A sow producing two litters of eight in each litter requires the following food daily when carrying her litter for, say, eight weeks :—6lbs. to 8lbs. of grain, 1½galls. skimmed milk, 5lbs. greenstuff, lucerne, &c. With foodstuffs at present low values, and pigs realising excellent prices, there are great possibilities in pig-raising, especially in districts where cows are kept as the main source of income. Such a fine source of revenue should not be neglected. In conclusion, it may be said that a liberal feeder may easily let the profits slip through his fingers by keeping his pigs in dirty, draughty, and cold sties; feeding a badly-bred, non-thrifty, long-legged, and unshapely animal; or by irregularity in feeding and careless marketing. When forwarded to market the pigs should be well protected from the sun and given, if possible, a good hosing with water; this will add to their comfort, and improve their appearance. They should not be travelled upon a full stomach. This caution is especially applicable in hot weather, as it often means the death of one or more. At present values it would be ridiculous to think of exporting. This can only be entertained when values are at a much lower level. The pig business to-day, and so far as one can foresee into the future, is a most profitable proposition by reason of easy breeding, cheap feeding, and highly remunerative values obtainable at an early age."

THE NEED FOR A MODEL FARM ON THE DRAINED LAND IN THE LOWER SOUTH-EAST.

Mr. Holzgrefe delivered an address as follows :—"It is generally understood that the Agricultural Department of the State exists for the purpose of teaching and helping the people to use their land to the best advantage. But there is a great difference between telling us that, if we do so-and-so we will get along all right, and in showing us that the advice is good by means of practical illustration. The various experimental blocks we now have and have had in the Millicent district and in other parts of the South-East have been of little use to agriculturists, graziers, and others, excepting the fact that they have taught us to be careful about spending money in working the poorer classes of land. The block that was worked at Millicent some years ago under the superintendence of Professor Lowrie, and owned by Mr. C. A. Malone, was one of the best. Most of the others have been failures. What we should teach young men who desire to go on the land is how to manage a farm and how to make it pay.

"We do not want any experimenting on our average soils. We have a good, assured rainfall, and land that will grow almost anything—grain of all kinds, potatoes, root and fodder crops, and nearly all kinds of English grasses and fruit. The question for the young farmer is not what to grow, but how to grow it. We have our Agricultural Bureau, which is doing and has done good work in increasing our knowledge of scientific methods of dealing with different soils, handling stock, &c.; but very few young men earning a living on the land take any interest in the Bureau and its meetings. A good many of them have joined our Branch here at different times, and after attending one or two meetings, have drifted away again and withdrawn from the Branch. This sort of thing is too slow for them. They are not usually inclined to accept advice given in the form of lectures and discussions. If the points are demonstrated, however, they will not be slow to follow on the same lines. The result, I am sure, would be a distinct improvement in our methods of farming and in the management of stock.

"The main point in this paper is to discuss the question of establishing a model farm. By this I mean a farm conducted on ordinary commercial lines by a manager who thoroughly understands his business and is up-to-date in his methods. Let the Government select or purchase 500 acres, or not more than 1,000 acres, of land of the average quality of the soil that is now being drained, or is already drained, to the north of Millicent, or on some part of the flats. The most important thing to consider is the choice of a manager to work and superintend the farm. I would prefer a young man, the son of a farmer, and who has had a good agricultural college training. There are plenty of smart young fellows at Roseworthy who could fill the position. The man selected should be able to handle all classes of farming machinery and implements, and should have some knowledge of livestock kept on an up-to-date farm, where grazing and cultivation are carried on conjointly.

"Another important matter is that the farm should be well appointed. It should have substantial buildings, and paddocks fenced and arranged to the best advantage, as a good deal of time is lost on a badly-arranged farm. If a farm of this kind were established in a district where grain, fodder, and root crops are grown, and stock-raising was also included in the work, I am sure it would pay working expenses and interest on the capital expended in purchasing land, buildings, implements, stock, &c. It would undoubtedly be of benefit to surrounding settlers. There should be days set apart at frequent intervals throughout the year when all farmers could inspect the farm, and obtain information regarding the system followed in manuring, harvesting, cropping, etc., and with regard to the rotation of crops, "Balance-sheets covering each year's operations should also be published in *The Journal of Agriculture*, together with full reports from the manager. There is a Government farm at Kybybolite, but it is chiefly an experimental station. I have nothing but good to say of its management, but it is not of much value to those working on different classes of soil. It is 108 miles from Millicent by train, and it takes the best part of three days to get there and back again.

"Moreover, the rainfall at Kybybolite is about 10in. less per annum than that at Millicent. It is a great mistake to say that 'anyone can work good land.' A model farm on average soil would help us to make far better use of our resources than we are making of them at the present time."

THE DISCUSSION.

Mr. J. B. Mitchell said the State was not warranted in going to the expense that would be entailed in establishing and maintaining a model farm as suggested by Mr. Holzgrefe. If the young farmers had sufficient interest in their work they could get the information necessary from the sources already provided; they could also go around to various private farms that were well conducted, and learn lessons from these.

Mr. Wray thought that if the young farmers had not sufficient interest in their work to attend lectures, &c., they should give up their occupation. Men desirous of learning could take employment with competent farmers and gain experience in this way.

The Hon. T. Pascoe said he had listened to the paper with a good deal of interest. The writer had suggested the establishment of a model farm, and the appointment of a young man from the Roseworthy Agricultural College as manager. Attendance at a college would not teach a young man the business part of farming. The young man who went there was not of sufficient age to thoroughly grasp the business part of a going concern. He gained a certain amount of experience and technical knowledge that would be useful to him in the future, but he would not be the man to go on to a farm and manage it, and teach farmers how farms should be managed. If a model farm were started here they would have to farm on those particular lines which were most payable, and little in the nature of experimenting could be done. If experiments had not been conducted by the Government on the experimental farms, or by individual farmers, on which they had made a loss, farming in South Australia would not be up to the standard which it had reached at the present time. They could make the College farm at Roseworthy pay well by growing hay; but it would lose its value as an educational institution. The reason he was content to see the experimental farms presenting a balance-sheet showing no profit was that they were carrying on experiments that would prove of benefit to South Australia in years to come. They should not measure the value of these farms by the balance-sheets, but by the increased prosperity of the farming industry in this State,

VISITORS ENTERTAINED.

The officers of the department, members of the Advisory Board, visiting delegates, and members of the press were entertained at lunch and dinner by the members of the local Branch.

CONFERENCE OF NORTHERN YORKE'S PENINSULA BRANCHES.

The Northern Yorke's Peninsula Branches of the Agricultural Bureau, together with the Yorke's Peninsula Field Trial and Show Society, held their annual conference at Kadina on April 17th.

The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), Director of Agriculture (Professor W. Lowrie, M.A., B.Sc.), Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), and Messrs. F. Coleman (vice-chairman), Geo. Geffrey, and G. G. Nicholls (secretary), of the Advisory Board, attended; and in addition the following delegates representing the undermentioned Branches :—Arthurton—J. Welch, W. R. Stephenson ; Blyth—E. C. Deland ; Kadina—H. Paterson, R. C. Price, J. H. Price, M. Quinn, F. G. Brinkworth, J. N. Pedler, R. Correll, R. Truscott ; Maitland—S. P. Smith, C. A. Pitcher, G. Bentley, H. G. Tossell ; Moonta—J. Luke ; Paskeville—P. A. Uren, G. H. Bammann, T. M. Forbes, R. D. Norris, F. H. Bussenschutt, H. F. Roch, A. H. Bussenschutt, A. F. Bussenschutt, E. G. Lamming, J. P. Pontifex, T. R. Brinkworth ; Pine Forest—W. Attenborough, D. Hanna, R. D. Goodridge, E. Hewett, J. Edwards, J. G. Beare ; Port Broughton—H. P. Whittaker, W. R. Whittaker, T. E. Pattingale, A. J. Fletcher, J. H. Fletcher, and H. M. Adams.

The chair was occupied by the President of the local Branch of the Bureau (Mr. R. Correll), who extended a hearty welcome to the visitors.

MINISTER OPENS THE CONFERENCE.

The Hon. T. Pascoe said he thought he would not be doing his duty to such an important conference as this if he neglected to be present. The two institutions which had combined for the purpose of holding the conference that day were of such a nature that they must run hand in hand in agricultural work. By field trials they would be enabled to secure those implements which were best suited for their land.

It was on Yorke's Peninsula that the stump-jump plough was first used, generally by the farmers, and in this way the Field Trial Society had done much in the way of solving the problems connected with farming in mallee and stony country.

This conference represented a greater number of old Branches of the Bureau than any other district conference. With one or two exceptions, those which were comprised in the district were formed in the 80's or early 90's. This showed that an early interest was taken in the educational side of agriculture. What was more, they had been able to keep up that interest, and it spoke well for the farmers that it was so.

ARTIFICIAL MANURES.

Not only had the lead been taken in the matter of stump-jump implements, but the practice of applying artificial manures was first generally adopted by Peninsula farmers. The names of Cudmore, Correll, and Parsons, and others known to the Conference were those of men who had enterprise enough to adopt manuring before the practice had been proved profitable. Statistics revealed the immense value of the use of manures and the adoption of more thorough methods of cultivation. In 1890 the average rainfall of Kadina (which was fairly representative of the average rainfall of the Lower North) during the growing period was 23·02in. The average yield of grain per acre was 5·7bush. In 1891 the fall of rain for the same period was 10·14in., and the yield dropped to an average of 3·21bush. per acre. Fourteen years later, in 1905, the rainfall at Kadina during the growing months was 17·09in., and the average yield 15·43bush. per acre. In 1912 the rainfall was 10·61in., and the average yield 13·33bush.—a very striking and significant fact, when compared with the 3·21bush. average of 1891, with a 10·14in. fall of rain.

Great as had been the improvement in the past, and satisfactory as had been the results, they should not rest content with their achievements. There were still agricultural problems for them to solve and practices which they could test, and it behoved them to maintain, at least, the enterprise that had characterised their work during the past years. Thus only could they maintain their reputation as leading farmers of their State and of the Commonwealth. He had pleasure in declaring the Conference open.

THANKS TO THE MINISTER.

Mr. J. Malcolm, in proposing a vote of thanks to the Minister, referred to the esteem in which the Hon. T. Pascoe was held. As had been said, the combination of the Field Trial Society and the Agricultural Bureau was a particularly happy one. He mentioned that arrangements had been made to hold a field trial at Bute in the near future, and he extended a hearty invitation to the Minister to be present. He moved a hearty vote of thanks.

Mr. J. N. Pedler seconded the vote.

Mr. Geo. Jeffrey (Advisory Board) referred eulogistically to the remarks of the Minister. Farmers throughout South Australia were not keeping the same number of sheep that they were 10 or 12 years ago. He admitted that the seasons had been against keeping sheep, but nevertheless he thought farmers were making a mistake. He was glad, as a member of the Advisory Board, to be present, and heartily supported the vote of thanks.

The Minister responded, and in reply to a question, gave some interesting particulars regarding the bulk handling of wheat, with which subject he had dealt fully at the Conference of Northern Branches held at Gladstone (*see* March issue, page 818).

IMPROVEMENT OF WHEAT

Mr. S. T. Barr, of the Pine Forest Branch, read a paper under the title of "Grading Seed." This will be found printed on page 992 of the April, 1914, issue.

Mr. F. Coleman (Vice-Chairman of the Advisory Board), said—"To a casual observer a flock of 100 stud Merino four-tooth ewes appear all alike, yet the breeder would say that not two of the ewes were exactly alike, and he would, if selecting some for show purposes, very soon have separated half a dozen that were better than the rest, and out of these one ewe that was a better all-round sheep than any other ewe in the flock. So, too, could he pick out very quickly a few that were distinctly inferior to the average.

"Quetelet illustrated this by comparing the height of 1,000 men of the same race : if ranged in line according to height, there were a few very tall men and a few very short, the great majority being only slightly higher or lower than the mean. This variation is inherent in all organic life. There are no two wheat plants exactly alike.

"Upon this inherent tendency to vary, the breeder, whether of Merino sheep or of wheat, bases the work of improving his stock. Australia, and South Australia, has done magnificent work in improving the Merino sheep ; there is a great field before us in the improvement of the wheat of the world, of which we already have grown the best.

"As there are breeds of Merino sheep adapted to certain climatic conditions, to soils and situations, so with the wheat plant, varieties from a cooler, heavier rainfall district, removed to a drier area take some seasons to become acclimatised. We may improve our wheats in three ways :—By grading ; selection and grading ; and cross-fertilising, selection, and grading.

GRADING.

"By grading we mean the re-cleaning of the harvest wheat of whiteheads, wild oats, chaff, straw, &c., and then sorting the cleaned wheat into three or four lots according to size, the first grade being the finest plump grain, the lowest grade consisting of the small cracked and pinched grains of wheat and foreign seeds, such as wild turnip, cabbage, drake, &c. Prof. Lowrie said, last year, that from 8 per cent. to 15 per cent. of these smaller grains could be removed, and that Dr. Cobb, of N.S.W., had shown by scientific tests that there was an 18 per cent. advantage in favor of sowing the larger grains; but allowing only 10 per cent. that would mean an addition of 2,000,000bush. to our annual wheat crop.

" The saving of the cracked grain alone for fowl or pig feed would in many cases justify the trouble of grading the seed. The drilling in of broken grain is pure waste of good food material. By grading, and sowing only the best and plumpest seed, our wheat will be kept from deterioration.

SELECTION.

" There has been unconscious selection from the very first; that yielding most value for food was given advantages. Productiveness insured survival, because of the greater chance of reproduction and of protection by man. Until less than a 100 years ago wheat was simply wheat. The names of Le Coutier who selected Talavera, of Shireff with his Squarehead, and of Major Hallet who raised his Nursery Pedigree wheats, are all comparitively recent. By means of selection the yield of wheat can be materially increased. The hand-picking of a crop to remove the strangers, or 'rogues,' or other plants not true to type, while often necessary when first growing a new variety of wheat, does not improve the wheat beyond securing a clean sample free from barley, &c. Plump grain alone may result from imperfect heads or poor plants; indeed the finest grain is often reaped from comparatively thin poor crops; hence the need for something more than simply the mechanical grading out of small, pinched, or defective grains.

" The most effective selection is in sowing year after year on separate plots the best grains from the best heads from the best plants; the best plants being judged in regard to yield, disease resistance, quality of wheat, retention of grain, and strength of straw. If the best 100 grains are selected from the best plant and this is repeated each year under rigorous selection, discarding unfitness in any direction, such as unevenness of growth, ripening unevenly, &c. seed from such plots will give an increase in yield and be pure and true to type. The seed from the small plot of 100 plants should give about 2lbs.; this seed used on the block seed plot of say a twelfth of an acre would give from ¾bush. to 1bush., and with this an acre could be sown the third season. Major Hallet, in 1859, from a head of wheat 4⅜in. long obtained 47 grains; by selection, he, in 1861, got from this wheat a head 8⅜in. long, with 123 grains, and 1,052 grains on one plant. In Minnesota an increase of from 22½bush. to 28½bush. per acre was secured in five years. The length of head, number of grains, and tillering power of the wheat plant can be largely increased by selection.

" The appearance of the crop is often deceptive. Federation, when I grew it first in 1901 with seven other wheats of Mr. Farrer's, I judged would come about fifth in order of yield out of 21 sorts all grown on exactly the same area of land; but somewhat to my surprise, as it has surprised many a farmer since, Federation came out well on top The practice advocated by Mr W. H. Hays in his Centgener system of small plots of equal size, each with 100 grains, the yield from which is carefully weighed, is a practical one. Selection has in South Australia given us such wheats as Dart's Imperial, Marshall's No. 3, Gluyas, Carmichael's Eclipse, Correll's Le Huguenot, King's Early, Viking, Petatz Surprise, College Eclipse, Leak's Rustproof, Baroota Wonder, Steinwedel, and many others. Selection is the most important part of wheat improvement. These points should be considered—(1) suitability to the district, (2) yielding capacity, (3) retention of grain, yet not too tough to thrash, (4) freedom from disease, (5) resistance to drought, (6) quality of grain, (7) good stiff straw, (8) early maturity in dry districts, and (9) resistance to bunt. If by selection we can get our wheat to yield only one grain more per head the yearly crop in South Australia would yield half a million extra bushels without effort or cost worth mentioning, in value some £100,000. Major Hallet increased the grain from 47 to 123 per head.

CROSS FERTILISATION.

"Chas. Darwin said 'Nature abhors perpetual self-fertilisation.' Wheat is normally self-fertilised, yet in cross-breeding we get increased vigor, breaks in the type, and wide variations, hence greater possibilities for selection. While the actual operation of cross-breeding wheat is not at all difficult, yet the judgment, skill, and experience required in selecting and fixing the type is a matter for experts and plant breeders, because of the time and attention this work involves at a busy time of the year. Probably our best wheat breeders do not average one cross in 100 that is worth persisting with, and from five to eight years are required to properly fix cross-bred wheats. I recommend the trial in small hand plots of new varieties to the district, and the careful inspection of his crops by the farmer about hay-cutting time ; an hour or so should be spent now and again marking with a stick the very best plants of the variety growing under normal conditions. Later, when ripe enough, he should cut these heads and thrash, clean, and sow the grain as a hand plot.

"Cross-breeding appears to have been practised widely only during the past 40 years or so. In America we have Pringle's Defiance; A. E. Blount's Improved Fife, Horneblende, &c.; Dr. Saunders' Preston, Stanley, and Marquis; A. N. Jones's Clawson and Winter Fife. Garton and Biffen, in England; Vilmorin, of France; Howard, of India; and in South Australia, Richard Marshall, claim front rank. The Agricultural Colleges and Experimental Farms are all doing excellent work; but above all stands the name of Wm. Farrer, of New South Wales, whose aim was to produce varieties with all the characteristic excellences of the very best of the old South Australian sorts, but yielding stronger flour ; to produce varieties which are equal to the very best grown in Minnesota or Manitoba in flour strength, but with mellower grain and of better appearance.

" In that aim he was wonderfully successful. Dr. Cherry, the Director of Agriculture in Victoria, said, in 1909, that Wm. Farrer had added in that season alone £250,000 to the value of the Victorian wheat crop as a result of his work."

Continuing, Mr. Coleman said Mr. A. G. Edquist, of the Education Department, had been doing a great deal of good work in encouraging the boys in schools in the agricultural districts to do something in the way of wheat selection. This work was begun in 1912, and the results thus extended over a period of two years. The average number of grains per head in Silver King variety had been increased from 26·4 to 50·9; in Federation, 32·7 to 41·35; and in Lotts, from 22·9 to 39·7. This was highly creditable. The work being done was not only valuable from the educational point of view, but the practical scientific value of the results was very considerable. Efforts in this direction were well worthy of encouragement, and greater support than had been given was warranted.

Some years ago Mr. Coleman had planted wheat with different spaces between the grains. The results were as follows :—

Space between Seeds.	Amount of Seed used per Acre.			Average Number of Heads per Plant.	Yield of Best Plant.		Yield of Grain per Acre.	
in.	bush.	lbs.	oz.		heads.	grs.	bush.	lbs.
3	1	19	0	3·43	6	156	49	27
6	0	19	12	8 22	14	462	37	50
9	0	8	12	12·5	19	627	25	35
12	0	5	0	16·0	38	1,254	18	25
15	0	3	3	19·21	33	1,089	19	21
18	0	2	4	29·94	41	1,353	15	33

These results were interesting, and indicated a means whereby a man who had only a small quantity of special grain from which he wished to raise seed for a larger area, could secure a greater yield by such very thin seeding as above.

DISCUSSION.

Mr. E. C. Deland (Blyth) said there was need for the selection and cleaning of seed. The great deficiency of the early wheats in this State was in their strength, *i.e.*, the amount of first-class flour that could be obtained from a grain of wheat. The old wheats, such as the old Purple Straws, yielded grain that was just about equal to the best Manitoban. The practice of selection carried out properly would benefit the whole State. Federation was one of the best wheats as an average yielder and for the quality of the grain. There was a great need for some farmers to clean their sample of grain better. Men who sold rubbish in their wheat were lowering the standard of South Australian grain in the markets of the world. The quantity of unsound grain in the average parcel of wheat put on the market in South Australia was about 2½lbs. per bushel. Millers could not make flour out of rubbish, but had to sell this back to the farmers in the bran and pollard. They thus paid the penalty, even within the borders of the State. With regard to the bulk handling of wheat, he had come to the conclusion, after careful consideration, that the State was not yet in a position to profitably adopt the system. The point was that, whether the wheat left here in bags or in bulk, it had to be bagged somewhere after the miller had dealt with it. The package must count in the cost. His opinion was that they could bag it more cheaply on the farms between times than they could in Port Adelaide or in London.

Mr. W. R. Stephenson (Arthurton) did not think farmers were so neglectful in regard to their wheat as had been suggested. On nearly every farm in this district the seed grader was to be found, and clean seed was put into the ground; but farmers were not careful enough in cleaning their wheat for market.

Mr. J. Malcolm (Wallaroo) said the quality of the wheat marketed in this State was not as bad as was represented, but if farmers knew the trouble millers had with barley in the wheat they would take more care to keep this out.

Professor Lowrie said improvement in the yield and the quality of wheat by individual effort on the part of farmers was a thing to be encouraged. He did not concur with the prevailing idea that because the wheat they were shipping was f.a.q., it was the wheat that should be shipped. If the f.a.q., standard were set at 61½lbs. when it could be set at 63lbs., they were not working in the best interests of farmers. As long as farmers brought down the f.a.q., and as long as they classed the grain with the rubbish that should be taken out, so long the reputation of South Australian wheat would suffer. His contention was that there would come a time when they would have two qualities of wheat offering in South Australia. The people who had 63lb. wheat should get the benefit of it, and nobody would lose. In regard to the selection of wheat the aim should be to start from the individual plant. If they picked a number of the best heads they did not get the constancy that they got by starting with one plant (the best that could be found) and working that up. They should take three or four instances, as they might not strike the particular plant that had the desired qualities in it. The work being done by Mr. Edquist was invaluable. It was by the multitude doing this kind of thing that they would get the improvement.

In biology there was a close correlation between the habit of growth of a plant and its habit of function. It could be modified by a long process of selection, but it was there in very strong force. Therefore it was necessary to get that characteristic that would carry with it high yield, tendency to withstand disease, and a plant that tillered well. Acclimatization had a strong effect on the yield of wheat, and if they had certain varieties that had stood by them, these were the ones to which they should give first attention in the matter of selection. They should not be too anxious to get hold of a wheat that was being talked about elsewhe

The strength of the wheat was very largely a matter of climate, and he did not think it wise to spend much time in cross-breeding with the idea of increasing this. On the question of grading they were practically all agreed; nevertheless it was not practised as widely as it should be.

AFTERNOON SESSION.

[The chair was occupied by Mr. A. Goodall.]

PEAS AND RAPE.

Mr. R. D. Norris (Paskeville) read the following paper:—"It has appeared to me that the good fallow in this district should produce more than a crop of wheat. With this idea in view, I selected a clean piece of fallow in September and prepared it for the drill, as would be done for a crop of wheat. The cereals which I selected to sow for early summer fodder were rape and field peas. In order to sow the rape evenly it was necessary to mix the seed with the super. I emptied the super., one bag at a time, upon a concrete floor, and mixed with this 10lbs. of seed. I then drilled it in at the rate of 80lbs. to the acre. The peas were sown at the same time through the oat and barley feeder, as thinly as the drill would sow them. I drilled them in on the 11th of September, and in about 15 days the seed had germinated. The growth was very rapid, and by the end of October the crop was almost 12in. high, scarcely any bare ground being visible. When the feed paddocks began to get thinned out in November the cattle and sheep were turned into it. They preferred the peas at first, but later ate the rape eagerly and did well on it. The quantity of feed which this crop yielded was surprising, well repaying the cost, and, in my opinion, as far as the peas are concerned, improving the land."

Mr. W. R. Whittaker (Port Broughton) had, from experience, come to the conclusion that rape seed could not safely be mixed with super. and left unsown for any time without the germinating qualities being affected. The better method was to drill in the super., allow the seed to fall on to the surface of the soil, and then just cover it. A crop of 11 acres of rape on his farm had carried 11 head of cattle, and in addition fattened 25 sheep.

In reply, Mr. Norris stated that he sowed rape on the same day that it was mixed with the super. The seed was put just below the surface, and his practice was to attach a small harrow to the drill.

STOCK ON THE FARM.

The Director of Agriculture (Prof. Wm. Lowrie, M.A., B.Sc.) said that in the districts represented by the Conference, where the average rainfall was about 15·8in., the problems that had to be solved in order to "keep up" the land were greater, for example, than those of the district represented by the Conference of the Northern Branches held at Gladstone. In that area the question, comparatively, was an easy one. The rainfall and the climatic conditions allowed of more elasticity in their methods than conditions here. Results from the point of view of profit might compare favorably, but there was not the choice of activities in this district. These lands were lighter on the whole, and in places were brushy, thin, and limestoney. On this class of land, if a man set out to grow one crop, say wheat, and grew it frequently, and thought to make up the soil with phosphatic manures alone, he would find that conditions would not respond as they had. The soil would become loose, especially if he ploughed it; there would be difficulty in consolidating the seed bed; the risk of the land drifting would be increased; and he would have to think hard for some method of carrying more stock on the country without diminishing his wheat yields, although diminishing his wheat area. The production of fodder for stock should receive more attention than was being given it. The size of the flocks of sheep in this and other areas was decreasing. This was largely explained by the fact that the State had experienced three bad seasons, from the point of view of lambing; at the same time the price of wheat was good, and farmers were encouraged to give this every attention. On some of the country they would have to alter this state of affairs. It would gradually be found that the same amount of work would result in smaller returns. The effect of fallowing at the present day was not equal to its effect 25 years ago. Some men were going to the extent of summer fallowing. The result was that they were doing away with nine-tenths of the feed that would have been on the stubble if it had been allowed to lie out. Fallowing was one of the best means of burning up the humus that was in the soil. That being so, and no means being taken to return the organic matter to the land, naturally it would lose its cohesion, its capacity to retain moisture, and the manures did not "tell" in it so well. This difficulty would come very slowly, and in some of the best land it appeared as though it would never come at all; but this would not be the case on the average mallee land.

STRAW.

It was a difficulty to know just what should be done with the straw. If they cut portion of it with the binder, and stacked it, the stock would consume part. But the expense in this regard was appreciable. On the other hand, it they ploughed it in the soil would become too open, and dry too freely. Therefore, this practice was not advisable on the light lands. If they burned it, for the first few years they would obtain better results, but he was strongly against burning stubble. A straw stack should be in every paddock, and when the feed was soft and watery, the stock would eat it at the stack. This was the means of getting rid of the straw, and at the same time preventing the loss of it as organic matter.

It would be found an advantage to put in a bigger proportion of oats. If this were done there would be less trouble with disease; for instance, takeall, Then it was worth growing a plot for horse feed; there was nothing that put more life into horses than oats. Following this crop also there was likely to be more feed in the stubble; the stock would do better on it, and when the time came for the paddock to remain out, it would carry more natural pasture.

PEAS.

The crop most to be desired, however, was peas. The objective was some means of restoring organic matter. In England, for example, this was attained by frequent growths of clover; in New Zealand, clover and peas were utilised, but here with a 15in. rainfall, clover could not be grown successfully. They could not hope to introduce such crops as tares, so peas practically constituted the only means at their disposal. He did not recommend green manuring, but would feed the peas off on the land. The results would not be apparent immediately, probably, but the effect would last in the land over a period of several years. They should have a certain area of the farm under this crop every year, and gradually work right round the farm. The more manure they put under the peas the more nitrogen they would get into the soil, and the advantage of the larger applications of phosphate would be shown in the succeeding crops.

SHEEP OR HORNED CATTLE.

Some few days ago someone in this district suggested that farmers should keep their young calves and artificially feed these. But there was no comparison between the returns to be secured from horned stock and those from sheep. He had noticed lambs from Bute selling in the market for 23s.; 16s. or 18s. per head for lambs would pay better than feeding cattle and selling them at £16 per head.

POORER LANDS.

For the poorer land in the district he advised the growth of rye. He did not think enough had been made of this crop. Five or six acres could very well be put under this, at the rate of about 2bush. of seed per acre. It would do well in the very dry seasons, would prove a good feed for stock, and very good thatching straw. White mustard might also be given consideration. There were large areas of country down the Peninsula towards Ardrossan that did not yield much that would give better results from a seeding of rye and white mustard to be fed off with stock.

One hesitated to recommend barley, he said, because of the alleged difficulty of keeping it out of the wheat. The danger was not very great, however, as the crop should be fed down early. The real difficulty that presented itself, however, was that of putting it in just when they were so busy with their general seeding operations. The question was whether it would pay them to keep an extra team of horses simply to put in a forage crop in the month of May. His opinion was that the matter would ultimately be solved by the utilisation of motor traction. With this they could plough from 12 acres to 20 acres in a day—whilst it was not being used the only expense was interest on capital. The practical solution, however, he thought, lay in the probability of owners of tractors contracting with different farmers to turn over a certain acreage on certain days ; the farmer meanwhile going on with his seeding. It would then be an easy matter for him to leave the seeding for a day whilst he put in the barley.

STABLE MANURE.

Another method of keeping up the humus content of the soil was by using stable manure. In this connection there was downright wilful waste on the part of many farmers. They were purchasing phosphates at £4 2s. 6d. per ton, and farmyard manure contained 6lbs. of tricalcic phosphate of lime to the ton. That equalled about 40lbs. of super. It contained about 12lbs. of nitrogen—as much as was in 1cwt. of dried blood ; it also contained from 6lbs. to 8lbs. of potash, the equivalent of ⅛cwt. of sulphate of potash, which was selling at from £16 to £18 per ton. Surely this was a source of humus that should not be neglected. If they put it on heavily it would cause the crop to be plethoric, and reduce the yield of wheat. They should get it on to the ground and work it in, and by this means full benefit would be secured.

QUESTIONS.

A number of questions were asked, and in reply to these the Director said the best way to put in peas was to plough the land, work it down, and put the seed on this. In the winter, the best results would be secured from farmyard manure by putting it on the fallows, even if it could not be ploughed in immediately. In the summer, however, this would result in a great deal of volatilisation. If it was intended to put wheat on land immediately following oats, it was advisable to put the stock on it in order that they might destroy any wild oats. In most cases it was best to allow peas to ripen before feeding them off. They then came in to carry and fatten stock when the rush of lambs was over and before the stubbles were ready. If rain fell early during April, and rape were planted, it would carry and fatten more stock than peas. If the land were at all stiff it would open it up below. On the other hand, when rains were late it would not do nearly so well. As a fattening crop it was the best that could be grown.

POULTRY-KEEPING.

Mr. P. A. Uren (Paskeville) contributed the following paper :—" Poultry-keeping may be profitably undertaken by farmers, either in wheat areas, where the second quality wheat may be turned into eggs or flesh, or as an adjunct to the orchard, keeping down the grubs and codlin moth and enriching the soil. Here they would find plenty of animal food, which is beneficial to the birds and increases egg production. On the dairy farm plenty of skim milk is usually available, and this takes the place of animal food and thereby increases egg production. On many farms the wives and daughters attend to this branch with the happiest results, most ladies proving very adept in mastering the details of successful chicken rearing.

" One has only to converse with some of the successful poultrymen (though many are difficult to draw, as they are somewhat loth to tell others how to equal or perhaps beat them at their own business) to realise that there are many who to-day are largely depending upon their fowls for a livelihood. To tell such men as these that poultry do not pay is to run the risk of being ridiculed. There is, of course, another side to this picture. While many are making a capital profit from their fowls, there are, perhaps, many more who are rapidly losing money, and who possibly see nothing before them but the loss of all or the bulk of their savings. It is a well-known fact that we invariably hear of the failures in life sooner than we hear of the successes. Bad news is never slow in spreading, and this is undoubtedly the reason why there appear to be so many more failures than successes in poultry-keeping. The statement, therefore, that poultry-keeping does not pay, may be, and frequently is, perfectly true; but, as a general statement, without qualification, it is altogether erroneous and misleading. I should like, as briefly as I can, to enumerate some of the causes of failure in poultry-keeping that I have personally come across, as it may be the means of preventing others from falling into similar pits. Actual management is not so often to blame as one thinks. Nevertheless, it is wellnigh impossible to devote too much attention to the care and wellbeing of the stock. It is perhaps in the details that a good many go wrong, *i.e.*, hatching too early or too late in the season, keeping a wrong sort, feeding unsuitable foods, or housing in badly constructed or insufficiently ventilated buildings. These points undoubtedly go a long way towards seriously reducing the profits and crippling the enterprise. Only in what may be termed exceptional circumstances is it wise to attempt running an establishment devoted solely and wholly to poultry. I know there are scores of such establishments in this country at the present time that are bringing in a comfortable living, but at the same time I believe I shall have the majority of practical poultrymen with me when I say that, except under special conditions, it is unwise to try to follow along these lines. It is better to begin in quite a small way, gradually developing as one learns which branch is best adapted to the locality, which varieties thrive best, and which class of work is the best and the most congenial. Lack of capital is a very common cause of failure. There have been many instances where, owing to lack of funds, a poultry farm has had to be closed just at the time when success was practically assured, providing the place could have been kept going a little longer.

" It is necessary that anyone who takes up this work should have enough to live on for at least a year or 18 months. No profit can be reasonably expected for a year, or even two years. I have known some men to start poultry farms who were doomed to failure from the very first. Some of these men were altogether unsuited to poultry-keeping, and others did not like the work, but merely went in for it because they had to do something. Unless one's heart is in the work it is doubly hard to succeed. Congenial work is a far more important factor than many imagine. Many people take up poultry-keeping because they have failed in other walks of life. Such men are not likely to succeed ; they would not succeed in any other business ; and it is surely unjust to blame the industry when it is really the man himself who is at fault.

" Very often the poultry-keeper is not to blame for the failure of his enterprise, but rather the location in which he is living ; and no matter how skilful or painstaking he or his manager may be, success is practically impossible. Some have attempted poultry-keeping in a cold, exposed, or in a low-lying, damp, situation ; others have tried to hatch and rear chickens during the winter in a very unfavorable spot ; and others again have started poultry-keeping miles from a town or railway station. In all such cases failure is almost certain from the first. The conditions, climate, &c., should always be carefully considered beforehand. There is no doubt whatever that the largest number of failures is due to inexperience. There are thousands who at this moment firmly believe that all one has to do in order to have a successful poultry farm is to buy a few hens, give them something to eat, provide them with some sort of a shed in which to sleep, and collect a continuous supply of new-laid eggs and a nice plump chicken for the table as often as required. How hopelessly mistaken this is only those who possess practical experience can fully realise.

" There is no branch of agriculture in which greater skill and knowledge are necessary, and there is certainly no branch in which constant care and ceaseless attention are more imperatively needed. I do not suggest that a fortune is to be made out of poultry, but I do say that when fowls receive proper attention and are looked after in a businesslike manner, they yield a larger profit in comparison with the amount of capital invested than any other farm stock. Until it is fully realised, however, that poultry-keeping is a business requiring skill, experience, common sense, and patience, plenty of hard work and constant attention, there will always be more failures than successes."

A number of questions dealing with details of management, &c., were asked and replied to by the writer of the paper.

EVENING SESSION.

TUBERCULOSIS.

The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) dealt with this subject. With tuberculosis, especially in cattle in this State, there was no occasion for alarm, he said. Whilst inspecting cattle slaughtered for export he was impressed with the fact that the average incidence of the disease was one in two thousand.

The Head of the Stock and Brands Department had given a great deal of attention to this disease, and he had expressed himself as pleased with the small amount of tuberculosis that special inspection had revealed. Therefore, the idea of a scare could be dismissed.

So far as the consumption of milk from tuberculous cows was concerned, an adult might possibly freely take this without coming to much harm; the chance of a solitary tubercular bacillus attacking the inside of a human being was not great. However, with young children there was a risk of infection, especially when the milk was from one cow only, and that happened to be infected. The precaution of boiling the milk was frequently resorted to, but with this there was a great possibility of its digestibility being impaired, and pure milk from a healthy cow was much to be preferred.

EARLY PRECAUTIONS.

Tuberculosis was an insidious disease; it secured a firm hold on an animal before it was noticed. Precautions should be taken immediately an owner became suspicious that there was something wrong with a cow. Where doubt existed the Stock and Brands Department should be immediately notified. It was much better to sacrifice one cow than to perpetuate a disease that might result in very severe loss ultimately. The presence in the herd of the affected cow meant a direct tax of at least 10 per cent. on the herd. Generally throughout South Australia there was little trouble, but the disease was prevalent in confined herds, such as those of the dairies around the city of Adelaide. In a country where the cattle lived in the open air the disease would gradually stamp itself out, and this suggested the best precautionary steps. The cows should not all be crowded into one bail, but milking sheds and such appointments should be arranged with an eye to sanitation.

DIFFERENT DIAGNOSIS.

From the point of view of the farmer the disease caused by the tubercular bacillus was very difficult to recognise. In the case of a cow the animal affected would not look herself; she would, perhaps, be ailing on a misty morning, but on a bright morning nothing would appear to be wrong with her. In the early morning she would cough, especially if she were hurried. As the disease progressed the cough became convulsive. When these symptoms were apparent there could be little doubt as to the nature of the trouble.

Tuberculosis did not confine itself to the breathing passages or lungs. The small glands in the throat and neck became affected; thus they got what was known as " lumpy jaw " if the beast picked up the disease with its food, but tuberculosis was not likely to be confounded with actinomycosis, or true lumpy jaw. In the cow, the womb and its appendages were very often affected. When the disease settled in these parts abortion and ultimate sterility were likely consequences. It was certainly false economy on the part of the farmer to throw the internal organs of affected beasts to pigs. This would cause the sows to slip, and the suckers would waste, instead of fattening.

The lecturer described in detail the development of the tubercular bacillus inside the cow, describing the breaking down of the tissue to pus and cheesy matter, which ultimately became calcified.

INFECTION.

Infection took place through the air passages and by means of the food. When the glands at the back of the throat, the gland between the lungs, and that over the heart were all affected, infection had taken place through both channels. Grapey growths inside the lining of the chest or stomach were an indication that tuberculosis was general throughout the beast.

The tuberculin test was being used to determine the existence of the disease. In about 99 cases out of 100 this could be relied on. The method of applying the test was described at length, and stress laid on the fact that an officer of the Stock and Brands Department only must apply it.

A tubercular cow, whose udder was unaffected, could yield affected milk. When the udder became infected there was, first of all, a swelling ; this would continue and harden. The quality of the milk would suffer, but the quantity would keep up.

Experiments conducted during the past few years had revealed that calves from highly tubercular mothers had almost invariably been at birth free of the disease. If they were reared on healthy milk the trouble did not manifest itself in them, but if infected milk were fed the calves would quickly become highly tubercular.

ERADICATION.

He knew of no country where tuberculosis could so easily be got rid of as in South Australia. But to do this involved the owners taking notice of any deviation from health on the part of the cattle. Where there was the slightest suspicion the Stock Department should be immediately advised. It was much better to stamp it out in the earlier stages than to allow it to remain until it became a real danger. In this State the spread of the disease was largely facilitated by the practice of " buying in." The general method of replenishing the herd was to buy, and the risk of infection from the cows thus obtained was considerable, so that new purchases should be kept separate till their sound health could be established without doubt.

VISITORS ENTERTAINED.

The officers of the department and visiting delegates were entertained a dinner by the members of the local Branch and Field Trial Society.

THE WHEAT MARKET.

During April the local wheat market remained steady, not much business being done in either farmers' lots or shipping parcels. For growers' lots, quotations at the end of the month were 3s. 8d. to 3s. 8½d. per bushel, on trucks, Port Adelaide, or the chief outports, compared with 3s. 7¾d. to 3s. 8¼d. on the corresponding date in 1913.

"Two-thirds of the season 1913-14 are over, and (states *Beerbohm's Corn Trade List* of April 3rd), so far, shipments have been in excess of requirements, which we estimate at about 1,300,000 quarters per week for the whole season, or, taking into account the excess to date, and allowing an extra 1,000,000 quarters to be taken by Austria-Hungary, Spain, &c., than previously reckoned, 1,100,000 quarters per week for the remaining 18 weeks of the present season ending July 31st next. The exports to Europe in the 34 weeks ending March 26th have amounted to 48,325,000 quarters, or an excess over the requirements (estimating same at 68,000,000 quarters for the whole year) of 4,000,000 quarters, but as the quantity afloat is now 6,245,000 quarters, against 4,185,000 quarters at the commencement of the season, 1st of August, it follows that the actual imports have been about 2,000,000 quarters more than wanted.

"Twelve months ago we printed a statement giving the probable shipments to Europe for the remaining four months of the season, viz., 25,550,000 quarters, whilst the actual figure proved to be 25,180,000 quarters. Below we give an estimate for the remaining four months of the present season ending July 31st next.

	Exports to Date.		Exports April to July.	
	1912-13.	1913-14.	1913.	*1914.
	Qrs.	Qrs.	Qrs.	Qrs.
U.S. and Canada	18,410	20,520	9,520	9,000
Argentina	7,815	2,085	4,753	2,000
Russia and other Black Sea Ports	8,930	13,620	3,855	7,000
Roumania	4,940	5,135	1,330	1,250
India	3,970	1,920	3,643	1,000
Australia	2,645	4,100	1,669	1,500
Sundries	810	945	410	450
Total	47,520	48,325	25,180	22,200

* Estimated.

"Last season the total shipments to Europe amounted to 72,700,000 quarters, and this quantity was generally believed to be fully sufficient for all requirements, after allowing for the large quantity of wheat harvested in 1912 unfit for human food. The last crop of wheat in European importing countries was about 4,000,000 quarters larger than in 1912, or, allowing for the better quality, the excess in wheat fit for milling purposes was probably quite 8,000,000 quarters. The estimate of this season's requirements at 68,000,000 quarters, against 72,700,000 quarters last year, would therefore appear to be ample.

"The requirements, at 1,100,000 quarters per week for the remaining 18 weeks of the season, would amount to about 20,000,000 quarters, whilst the probable shipments, according to the above estimate, would be about 22,000,000 quarters. There would certainly appear to be ample supplies of wheat to satisfy all requirements.

"The world's visible supply decreased 895,000 quarters during March, against a decrease last year of 1,465,000 quarters, and an increase in 1912 of 370,000 quarters.

THE WORLD'S VISIBLE WHEAT SUPPLY ON APRIL 1st.

	European.	U.S./Canada.	Total.	Eng. Average.
	Qrs.	Qrs.	Qrs.	Price.
1914	10,160,000	13,220,000	23,380,000	31/4
1913	9,705,000	14,100,000	23,805,000	31/3
1912	8,825,000	14,400,000	23,225,000	34/4
1911	13,445,000	8,275,000	21,720,000	30/3
1910	10,750,000	7,210,000	17,960,000	33/-
1909	9,960,000	8,000,000	17,960,000	36/-
1908	10,700,000	6,550,000	17,250,000	31/4
1907	9,570,000	10,160,000	19,730,000	26/8
1906	9,555,000	8,900,000	18,455,000	28/3
1905	10,635,000	6,170,000	16,805,000	30/9
1904	9,000,000	6,520,000	15,520,000	28/2

Date.		LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY Per Bushel.
April	4	Dull ; Liverpool steady, quiet	3/8 to 3/8½	3/8½ to 3/8¾	3/8½ to 3/8¾
	6	—	Do.	3/8¾	3/8¾
	7	Quiet ; Liverpool dull, easier tendency	Do.	3/8½ to 3/8¾	3/8½ to 3/8¾
	8	Steady, quiet ; Liverpool quiet ; Australian off coast. 4/6⅛	Do.	Do.	Do.
	9	Dull, easier tendency	Do.	3/8¾	3/8¾
	10	—	Do.	Do.	Do.
	11	—	Do.	Do.	Do.
	13	—	Do.	Do.	Do.
	14	Quiet	Do.	3/8¾ to 3/9	3/8¾ to 3/9
	15	Dull	Do.	Do.	Do.
	16	Dull, no demand	Do.	3/8¾	3/8¾
	17	Dull and neglected	3/8	3/8½ to 3/8¾	3/8½
	18	Very dull, lower ; Liverpool quiet ; Australian arrived, 4/4⅞	Do.	3/8½	Do.
	20	—	Do.	Do.	Do.
	21	Dull and neglected	Do.	Do.	Do.
	22	Steadier, not active ; Jan.-Feb. 4/5¼	Do.	Do.	Do.
	23	Firm, fair inquiry ; Liverpool steadier, not active	3/8 to 3/8½	3/8½ to 3/8¾	3/8½ to 3/8¾
	24	Firmly held ; Jan.-Feb. and March-April 4/6	Do.	3/8¾	3/8¾
	25	Steady, quiet	Do.	Do.	Do.
	27	—	Do.	3/9	3/9
	28	Very firm, April-May 4/5¾ ; Liverpool firmly held, inactive	Do.	Do.	Do.
	29	Steady, quiet; Liverpool slightly firmer	Do.	Do.	Do.
	30	Steady, but quiet ; Australian arrived, 4/5¾	Do.	Do.	Do.
May	1	Steady, quiet. March-April 4/5¾ ; Liverpool dull, no demand	Do.	Do.	Do.
	2	—	Do.	Do.	Do.
	4	—	Do.	Do.	Do.
	5	Steady, but quiet : Liverpool firm, fair inquiry	Do.	3/9¼ to 3/9½	3/9¼ to 3/9½

Steamer Freights.—(May 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 21s. 6d. per ton ($6\frac{9}{10}$d. per bushel) ; to South Africa, 20s. per ton (6⅖d. per bushel). Parcels. Port Adelaide to London-Liverpool, or Continent, 20s. per ton (6⅖d. per bushel) : Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel) ; to Sydney, 10s. 6d. per ton (3¼d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 21s. 3d. per ton (6⅘d. per bushel) ; South Africa, 18s. 9d. per ton (6d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

The General Manager of the Government Produce Department reports on May 1st:—

Butter Factory.—The supply of cream is falling off, but owing to the much better weather experienced lately the quality is improving, and the demand for the butter is increasing. There was a drop in prices during the month; the present quotations being, superfine, 1s. 4½d.; pure creamery, 1s. 3d.

A. W. Sandford & Co., Limited, report on May 1st—

Butter.—Local supplies have been much below trade wants, so that importations from the neighboring States have been arriving to cope with the demand. However, the light general showers experienced in practically all parts of the State during the month will give a start to pastures and cause increasing quantities of dairy produce to come forward. Top values show slight fluctuations, while separators and store and collectors' lines have improved—" Alfa " is selling at 1s. 4d.; " Primus," 1s. 3d.; choice separators and dairies, 1s. to 1s. 1½d.; store and collectors', 10d. to 11d. per pound

Eggs.—An advance of 2½d. per dozen for new laid is recorded, and holders of refrigerated and pickled sorts are now taking advantage of the good rates ruling. Hen eggs, 1s. 5d.; ex-refrigerator, 1s. 2d. to 1s. 3d.; well preserved, 1s. 1d. per dozen.

Cheese.—Owing to export buyers operating on this market values have improved, and stocks here are being considerably reduced. Present quotations are from 7½d. to 8d. per pound for large to loaf.

Honey.—Purchasers for export have experienced difficulty in executing anything like their orders for prime clear extracted; local buyers are also operating freely. Prime samples, 3d. per lb.; beeswax, 1s. 2d. to 1s. 3d. per lb.

Almonds.—The trade are realising that the crop is not up to expectations, and are, therefore, taking up all offering at improving rates. Brandis are selling at 6¾d. to 7d. per lb.; mixed softshells, 6½d.; hardshells, 3½d.; kernels, 1s. 6d.

Bacon.—A very steady market has prevailed throughout the Commonwealth, there being no alteration to report in price, although the factories have been able to send in heavier consignments. Best factory cured sides, 9¾d. to 10¾d. per lb.; hams, 10d. to 1s.; lard in skins, 8½d.; bulk, 7d.

Live Poultry.—The penning before Easter was exceptionally heavy and quite equal in quantity to Christmas markets, but there was a tendency to lower rates. During the latter weeks of the month very much improved rates were obtained, and the market at the moment is good for all classes, especially quality. Good table roosters brought 3s. to 3s. 8d. each; nice conditioned cockerels, 2s. to 2s. 6d.; hens, 1s. 9d. to 2s. 3d.; ducks, 1s. 8d. to 2s. 6d.; geese, 3s. 6d. to 4s.; pigeons, 5½d.; turkeys, 5d. to 10d. per lb. live weight for medium to good table sorts.

Potatoes and Onions.—Fair parcels of good potatoes have arrived from the Millicent districts, but Mount Gambier deliveries were disappointing both in quality and quantity. Onions.—Good supplies offering from Mount Gambier and local sources, and as there has been no export inquiry the market has ruled steady. Present quotations—Potatoes, £5 2s. 6d. to £6 per ton of 2,240lbs. on trucks Mile End or Port Adelaide; 6s. to 7s. per cwt. in the market. Onions—£7 per ton of 2,240lbs. on trucks Mile End or Port Adelaide; 7s. to 8s. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of April, 1914, also the average precipitation to the end of April, and the average annual rainfall.

FAR NORTH AND UPPER NORTH.

Station.	For April, 1914.	To end April, 1914.	Av'ge. to end April.	Av'ge. Annual Rainfall
Oodnadatta	0·22	2·81	2·02	4·76
Tarcoola	0·33	0·41	2·39	7·58
Hergott	0·68	4·26	1·92	6·04
Farina	0·82	2·73	2·20	6·70
Leigh's Creek	0·90	2·36	2·56	8·66
Beltana	0·76	1·90	2·88	9·22
Blinman	0·80	2·08	3·68	12·85
Hookina	0·65	1 68	—	—
Hawker	0·69	1·36	2·56	12·22
Wilson	0·46	0·75	2·74	11·78
Gordon	0·53	0·99	2·15	10·26
Quorn	0·43	1·02	2·77	13·78
Port Augusta	0·75	1·74	2·57	9·46
Port Augusta W.	0·70	1·50	2·26	9·36
Bruce	0·42	1·41	2·10	10·01
Hammond	0·75	1·50	2·80	11·46
Wilmington	1·02	1·49	3·75	18·26
Willowie	1·08	1·77	2·59	11·90
Melrose	1·22	2·79	4·97	23·04
Booleroo Centre	1·07	1·70	3·33	15·83
Port Germein	0·74	1·36	3·14	12·84
Wirrabara	1·29	2·90	3·88	18·91
Appila	0·88	1·56	3·56	15·08
Cradock	0 39	0 93	2·54	10·86
Carrieton	0·47	1·23	2·65	12·22
Johnburg	0·27	1·68	2·14	10·21
Eurelia	0·68	1·19	2·90	13·24
Orroroo	0·86	1·83	3·31	13·42
Black Rock	0·66	2·05	2·97	12·25
Petersburg	0·87	2·76	3·08	13·07
Yongala	0·97	2·30	2·99	13·94

NORTH-EAST.

Station.	For April, 1914.	To end April, 1914.	Av'ge. to end April.	Av'ge. Annual Rainfall
Ucolta	0·57	1·37	—	—
Nackara	0·46	1·58	—	—
Yunta	0·36	1·35	2·30	8·22
Waukaringa	0·55	2·00	2·13	7·94
Mannahill	0·68	1·88	2·39	8·46
Cockburn	0·56	1·54	2·37	7·97
Broken Hill, NSW	0·88	1·61	2·97	9·63

LOWER NORTH.

Station.	For April, 1914.	To end April, 1914.	Av'ge. to end April.	Av'ge. Annual Rainfall
Port Pirie	0·92	1·71	3·23	13·21
Port Broughton	1·50	2·33	3·31	14·33
Bute	1·06	2·42	3·31	15·42
Laura	0·74	1·62	3·86	18·22
Caltowie	0·54	1·22	3·65	17·27
Jamestown	0·62	1·61	3·55	17·46
Gladstone	0·42	1·11	3·48	16·00
Crystal Brook	0·81	1·81	3·40	15·62
Georgetown	0·75	1·69	3·95	18·32
Narridy	0·85	1·61	2·62	16·79
Redhill	1·09	2·18	4·50	16·79
Spalding	0·75	1·53	3·60	20·25

LOWER NORTH—*continued.*

Station.	For April, 1914.	To end April, 1914.	Av'ge. to end April.	Av'ge. Annual Rainfall
Gulnare	0·89	1·45	3·26	19·74
Bundaleer W. Wks.	0·79	1·16	3·16	17·29
Yacka	0·60	1·13	3·19	15·27
Koolunga	0·75	1·71	3·45	15·94
Snowtown	0·53	1·86	3·34	15·70
Brinkworth	0·68	1·58	2·96	15·48
Blyth	1·00	1·79	3·61	16·34
Clare	1·56	2·38	4·91	24·30
Mintaro Central	1·06	1·73	4·07	21·99
Watervale	1·53	2·56	5·46	27·17
Auburn	1·85	1·77	5·07	24·25
Hoyleton	0·93	1·45	4·05	17·96
Balaklava	1·33	2·49	3·74	16·03
Port Wakefield	1·44	3·05	3·51	13·13
Terowie	0·55	1·71	3·17	13·71
Yarcowie	0·37	2·14	3·17	13·91
Hallett	0·46	1·62	3·31	16·40
Mount Bryan	0·47	2·17	2·91	15·73
Burra	0·67	1·51	3·69	17·82
Farrell's Flat	0·92	1·81	3·94	18·87

WEST OF MURRAY RANGE.

Station.	For April, 1914.	To end April, 1914.	Av'ge. to end April.	Av'ge. Annual Rainfall
Manoora	1·81	2·73	3·73	18·09
Saddleworth	1·63	2·69	4·36	19·69
Marrabel	1·49	3·76	4·00	18·94
Riverton	1·89	3·28	4·39	20·48
Tarlee	1·29	3·72	3·96	17·48
Stockport	1·25	3·68	3·61	15·89
Hamley Bridge	1·14	2·96	3·84	16·45
Kapunda	1·20	5·31	4·30	19·67
Freeling	0·82	2·37	3·92	17·85
Greenock	1·84	4·12	4·36	21·46
Truro	1·67	4·02	3·98	19·74
Stockwell	1·29	3·57	4·20	20·30
Nuriootpa	1·43	3·56	4·28	21·25
Angaston	1·59	4 04	4·36	22·25
Tanunda	2·60	5·04	4·60	22·28
Lyndoch	3·15	5·28	4·40	23·01

ADELAIDE PLAINS.

Station.	For April, 1914.	To end April, 1914.	Av'ge. to end April.	Av'ge. Annual Rainfall
Mallala	0·86	2·69	3·80	16·88
Roseworthy	1·47	3·44	3·91	17·31
Gawler	2·43	5·03	4·18	19·21
Two Wells	2·44	4·15	3·70	16·36
Virginia	1·89	3·50	3·89	17·58
Smithfield	2·20	3·66	3·62	17·30
Salisbury	2·83	4·23	4·14	18·57
North Adelaide	1·75	4·71	4·41	21·49
Adelaide	1·77	4·27	4·26	21·04
Brighton	1·07	2·49	4·15	19·93
Glenelg	1·25	2·89	3·97	18·85
Magill	2·55	5·34	5·26	25·69
Glen Osmond	1·98	4·37	5·11	25·20
Mitcham	2·10	4·26	4·63	23·47
Belair	1·96	3·28	5·71	28·64

RAINFALL—*continued.*

Station.	For April, 1914.	To end April, 1914.	Av'ge. to end April.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.				
Houghton	—	—	—	—
Teatree Gully	3·94	6·09	5·68	28·19
Stirling West	4·62	7·60	8·61	46·70
Uraidla	4·20	7·35	8·22	44·35
Clarendon	3·51	5·32	6·66	33·67
Morphett Vale	2·89	4·73	4·91	23·32
Noarlunga	2·08	3·29	4·19	20·28
Willunga	2·49	3·78	4·88	25·98
Aldinga	2·61	3·86	4·18	20·34
Normanville	3·04	5·25	3·96	20·65
Yankalilla	3·57	5·54	4·53	22·78
Cape Jervis	2·44	4·34	3·04	16·34
Mount Pleasant	3·73	5·93	4·97	26·87
Blumberg	4·47	7·62	5·45	29·38
Gumeracha	5·00	7·45	5·91	33·30
Lobethal	5·08	7·19	6·03	35·38
Woodside	3·73	6·12	5·49	31·87
Hahndorf	2·85	5·80	6·19	35·45
Nairne	2·97	5·53	5·69	28·83
Mount Barker	3·66	6·14	5·65	30·93
Echunga	4·89	7·11	6·21	32·83
Macclesfield	4·37	7·00	5·77	30·72
Meadows	4·83	7·74	6·91	35·52
Strathalbyn	2·76	4·18	3·99	19·28
MURRAY FLATS AND VALLEY.				
Wellington	1·91	3·95	3·63	15·01
Milang	1·46	2·55	3·62	16·08
Langhorne's Bdge	1·12	3·96	3·46	15·27
Tailem Bend	1·48	3·88	—	—
Murray Bridge	0·99	2·76	3·50	14·32
Callington	1·37	3·44	3·57	15·65
Mannum	1·18	3·29	3·04	11·67
Palmer	1·30	3·38	3·28	15·60
Sedan	1·23	2·82	2·73	11·92
Blanchetown	0·26	0·90	2·84	10·71
Eudunda	1·37	3·00	3·63	17·33
Sutherlands	0·78	2·55	1·95	10·60
Morgan	0·36	1·29	2·27	9·29
Overland Corner	0·61	2·84	3·02	11·42
Renmark	0·85	2·23	2·62	10·93
Loxton	0·66	1·62	—	—
WEST OF SPENCER'S GULF.				
Eucla	0·33	1·18	3·36	10·13
White Well	0·31	1·12	2·14	9·67
Fowler's Bay	0·58	1·29	2·27	12·11
Penong	0·55	2·17	2·31	11·93
Murat Bay	0·28	1·41	—	—
Smoky Bay	1·01	2·21	—	—
Streaky Bay	1·22	2·65	2·66	15·31
Port Elliston	1·78	3·30	2·52	16·49
WEST OF SPENCER'S GULF—*continued.*				
Port Lincoln	2·77	3·91	3·61	19·88
Tumby	1·63	3·94	2·93	15·00
Carrow	1·36	3·41	—	—
Cowell	0·93	2·75	3·18	11·76
Point Lowly	—	0·66	2·92	12·21
YORKE'S PENINSULA.				
Wallaroo	2·53	3·53	3·20	14·05
Kadina	1·46	2·60	3·54	15·88
Moonta	2·92	4·52	3·53	15·22
Green's Plains	1·26	2·14	3·21	15·73
Maitland	2·88	4·30	3·96	20·08
Ardrossan	1·61	2·89	2·98	13·89
Port Victoria	2·47	3·17	3·15	15·20
Curramulka	4·45	6·31	3·55	18·51
Minlaton	3·79	5·82	3·34	17·41
Stansbury	2·16	3·88	3·39	17·06
Warooka	3·08	5·34	3·04	17·71
Yorketown	2·00	4·23	3·22	17·47
Edithburgh	1·87	4·09	3·43	16·48
SOUTH AND SOUTH-EAST.				
Cape Borda	4·24	5·39	4·22	25·09
Kingscote	2·63	4·67	3·28	18·95
Penneshaw	2·88	4·79	3·89	21·34
Cape Willoughby	2·05	3·39	3·78	19·69
Victor Harbor	1·94	3·64	4·48	22·18
Port Elliot	2·32	3·56	4·21	20·33
Goolwa	2·10	3·98	3·84	17·93
Pinnaroo	1·13	2·15	3·29	16·74
Parilla	2·08	3·43	—	—
Lameroo	1·29	2·91	3·38	16·55
Parrakie	0·95	2·34	—	—
Geranium	1·26	3·11	—	—
Peake	1·60	3·83	—	—
Cooke's Plains	1·70	3·55	3·27	14·74
Meningie	2·10	3·24	3·83	18·87
Coonalpyn	1·29	4·54	3·64	17·49
Tintinara	1·71	3·92	3·95	18·78
Keith	2·52	5·25	—	—
Bordertown	1·46	3·15	3·96	19·76
Wolseley	1·83	4·45	3·62	17·72
Frances	1·37	4·04	4·03	20·74
Naracoorte	1·65	4·66	4·41	22·60
Penola	2·18	3·44	5·29	26·78
Lucindale	2·54	3·89	4·43	23·32
Kingston	3·05	6·03	4·53	24·73
Robe	1·96	5·42	4·44	24·69
Beachport	1·81	5·33	5·21	27·51
Millicent	2·46	6·57	5·87	29·25
Mount Gambier	3·01	4·37	6·59	32·00
C. Nrthumberland	3·56	6·63	5·20	26·63

AGRICULTURAL BUREAU REPORTS.

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Branch.	Report on Page	Dates of Meetings.	
		May.	June.
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Angaston	*	9	6
Appila-Yarrowie	*	—	—
Arden Vale & Wyacca	*	—	—
Arthurton	*	—	—
Balaklava	*	—	—
Beaufort	1084	—	—
Beetaloo Valley	1085	—	—
Belalie North	*	9	6
Berri	‡	9	6
Blackwood	1112	11	8
Blyth	1090	2	6
Booleroo Centre	†	1	5
Borrika	1102	—	—
Bowhill	*	—	—
Burra	*	8	5
Bute	*	—	—
Butler	*	—	—
Caltowie	*	9	6
Canowie Belt	*	—	—
Carrieton	1083	7	4
Cherry Gardens	1103	5	2
Clanfield	*	—	—
Clare	*	8	5
Clarendon	1103	4	8
Claypan Bore	1099	—	—
Colton	1098	9	6
Coomandook	1100	—	—
Coomooroo	*	—	—
Coonalpyn	1100	—	—
Coonawarra	1112	—	—
Coorabie	1098	—	—
Cradock	*	—	—
Crystal Brook	*	—	—
Davenport	1083	—	—
Dawson	*	—	—
Dingabledinga	*	8	12
Dowlingville	*	—	—
Elbow Hill	1096	—	—
Forest Range	1103	7	4
Forster	*	—	—
Frances	*	8	5
Freeling	*	—	—
Friedrichswalde	1091	—	—
Gawler River	1091	—	—
Georgetown	1085	9	6
Geranium	*	30	27
Gladstone	1086	—	—
Glencoe	1113	—	—
Goode	*	—	—
Greenock	*	—	—
Green Patch	1098	4	8
Gumeracha	*	5	2
Hartley	1103	6	3
Hawker	*	4	8
Hookina	*	5	2
Inman Valley	1104	—	—
Ironbank	1104	8	5
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Kadina	*	5	2
Kalangadoo	1116	9	13
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Keith	1114	9	6
Kingscote	*	5	2
Koppio	1096	—	11
Kybybolite	1116	7	4
Lameroo	1100	—	—
Laura	1086	8	5
Leighton	*	—	—
Lipson	*	—	—
Longwood	1109	6	3
Loxton	*	—	—
Lucindale	*	16	13
Lyndoch	†	7	4
MacGillivray	1112	—	—
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Mangalo	1099	2	6
Mannum	*	30	27
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Moonta	1095	—	—
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Morphett Vale	*	—	—
Mount Barker	1109	6	3
Mount Bryan	1087	9	6
Mount Bryan East	1090	2	6
Mount Gambier	1115	—	—
Mount Pleasant	*	8	12
Mount Remarkable	1081	6	3
Mundoora	1090	4	8
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Branch.	Report on Page	Dates of Meetings. May.	Dates of Meetings. June.	Branch.	Report on Page	Dates of Meetings May.	Dates of Meetings June.
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Naracoorte	1115	9	13	Spalding	1088	15	5
Narridy	1090	—	—	Stockport	1094	—	—
Narrung	†	—	—	Strathalbyn	†	—	—
North Booborowie	†	—	—	Sutherlands	1102	9	6
North Bundaleer	1088	—	—	Tarcowie	1082	5	2
Northfield	1092	5	2	Tatiara	*	2	6
Orroroo	*	—	—	Tintinara	*	—	—
Parilla	1101	—	—	Two Wells	*	—	—
Parilla Well	*	—	—	Uraidla and Summert'n	*	4	1
Parrakie	*	2	6	Utera Plains	‡	9	6
Paskeville	*	7	4	Waikerie	*	—	—
Penola	*	2	6	Warcowie	1084	—	—
Penong	1097	9	13	Watervale	*	—	—
Petina	*	—	—	Wepowie	1084	—	—
Pine Forest	*	5	2	Whyte-Yarcowie	*	—	—
Pinnaroo	*	—	—	Wilkawatt	1102	—	—
Port Broughton	*	8	5	Willowie	1082	—	—
Port Elliot	1112	16	20	Willunga	*	2	6
Port Germein	1088	16	—	Wilmington	†	6	3
Port Pirie	*	—	—	Wirrabara	1083	9	6
Quorn	1081	—	—	Wirrega	1116	—	—
Redhill	*	5	2	Woodside	†	—	—
Renmark	*	—	—	Wynarka	*	—	—
Riverton	*	—	—	Yabmana	1098	—	—
Roberts and Verran	1097	—	—	Yadnarie	1098	9	6
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Salisbury	1092	5	2	Yongala Vale	1088	4	8
Shannon	*	—	—	Yorketown	1095	9	13

*No report received during the month of April. † Formal report only received.
‡ Held over until next month.

* * *

ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

May 13th and June 10th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

MOUNT REMARKABLE (Average annual rainfall, 14·43in.).

March 18th.—Present: 12 members and three visitors.

Experimental Plots.—The Chairman (Mr. N. S. Giles, B.Sc.) undertook to conduct plots with the idea of producing a strong, well-selected, and prolific wheat plant. It was proposed to procure two varieties (one red and one white, if possible) each of early, medium, and late wheats.

Levers.—Mr. N. S. Giles, B.Sc., gave an interesting and instructive paper on "Levers: their Uses, Principles, and Application." Mr. Giles showed the practical application of the lever principle with reference to straining fences—that it was not sufficient to place one inner strut as the angle of two converging lines of fence. He practically demonstrated that if two tug-of-war teams were pulling upon a rope, there was no more strain upon the rope than if one team alone pulled the rope with the opposite end fastened to a post. Also, that by a little calculation a swing on an implement could be so arranged as to work a large and a small horse side by side by giving the smaller horse the longer end from the fulcrum, therefore the greater leverage. It was also demonstrated why a single cable round the tree to be uprooted by "The Forest Devil" should be as strong as the two cables fixed to the wheel which the lever operated.

QUORN (Average annual rainfall, 13·78in.)

April 11th.—Present: six members.

Pickling Wheat.—Mr. A. F. Noll contributed a paper on this subject, in which he said that there was little danger in sowing unpickled seed early in the season when the ground was dry and the seed free from smut. Seed sown late in the season, however, should be pickled. He used a cask of about 60galls. capacity, and into this put about 40galls. of water, and in this dissolved 4lbs. of bluestone by suspending it in a hessian bag just below the surface. In this manner it would dissolve in a few hours. A derrick with a swinging arm and pulley and rope attached was erected near the cask. A bag of seed was split into two butts, and tied loosely to allow the seed to swell. The seed was allowed to remain in the solution for about 3min. He then raised it to a draining table, which sloped back into the cask. A 1 per cent. solution was of sufficient strength for ordinary use. The pickled wheat should be left in the open air to dry and the bags turned every day to prevent mould. When dry the wheat could be stacked in the barn until required. Damp seed would not run freely through the drill. In the discussion which followed Mr. Britza said that by mistake he had allowed a bag of wheat to soak all night in the solution. He had sown the seed on boggy land, and the resultant crop was badly smutted. Mr. Brewster considered it advisable to pickle all wheat, whether sown on wet or dry land. The Hon. Secretary, however, considered it unnecessary to pickle seed if it were clean and sown before rain. The Chairman read an article on "Bunt" by Mr. H. Ross, Chief Inspector of Agriculture in New South Wales, in which was pointed out the mistake farmers made by using galvanized iron for troughs to drain the solution back into the cask. Mr. Britza made a practice of giving the iron three or four coats of water paint before use. In reply Mr. Noll said that the majority of farmers advised pickling the bags with the wheat.

TARCOWIE (Average annual rainfall, about 15¼in.)

April 12th.—Present: 15 members.

Pickling Wheat.—Mr. D. Butterick contributed a paper on this subject. He advocated the pickling of wheat with a 1 per cent. solution of bluestone. He preferred dipping the seed to the floor method, it being much quicker and easier. A hole about 4ft. 6in. deep and large enough to enable a large bag of wheat to be submerged therein should be cemented. A table top, with sloping sides, to allow the solution to drain back into the hole, should also be constructed. The bluestone should be placed in two sugar bags and submerged in the water. A bag of seed should be allowed to remain in the solution for from one to two minutes, after which it should be turned upside down so that the solution would drain back through the wheat. He believed in pickling in March, so that the wheat became thoroughly dry before being sown. It would then run more freely and evenly through the drill. The pickle would go through the bags much more quickly if they were fairly slack. They should stand for about 24 hours before being stacked. In the discussion which followed Mr. Breuer favored pickling a month before seeding. Mr. Symons thought early pickling was liable to destroy the grain. Mr. W. Ninnis preferred boiling the bluestone. The bags should not be tightly filled, as they were liable to burst. Mr. Travers preferred dry sowing. He had once sown a bag of pickled wheat in the centre of a crop which had been dry sown, and the pickled portion only was affected with smut. Mr. Butterick had kept a bag of pickled wheat for three years and the seed was in no way injured.

WILLOWIE.

April 17th.—Present: seven members and five visitors.

Shoeing Horses.—The following paper was read by Mr. F. Richter:—"The horse's foot in the natural state is almost round, and very elastic at the heel. The frog is broad, plump, and of a soft yielding character. The commissures are open and well defined, the sole concave, the outside crust from the heel to the toe increasing from a slight level to an angle of 45 degrees. Consequently, as the foot grows it becomes wider and longer on account of the amount of horn secreted, and narrower and shorter on account of wearing. If a shoe is fitted accurately to the foot after it had been dressed down well it will be found too narrow and short after the lapse of a few weeks. If an unyielding shoe of iron is nailed firmly to this naturally enlarging and elastic hoof it prevents its natural expansion almost wholly, and does not allow the foot to grow wider at the quarters as it grows down, consequently the foot is changed in shape by the continued restraint of the shoe, from a nearly round healthy foot to a contracted and unhealthy condition, as is generally seen in horses that have been wearing shoes for a few years. The principles which should govern shoeing are few and simple. It is surprising, considering the serious consequences involved, that it should be done with so little consideration. The object of the shoer should be, in trimming and preparing the hoof for the shoe, to keep the foot to its natural shape. This involves first cutting away any undue accumulation of horn affecting in the least its health and freedom, making the shoe the shape of the foot, fitting and fastening the shoe to the foot in such a manner as to interfere as little as possible with its health, growth, and elasticity. The preparation of the foot involves the cutting away of about the proportion of horn which, coming in contact with the ground, would have worn off, or which has accumulated since the last shoeing. If the shoes have been on a month the horn that was secreted in that time should be removed. Judgment must rest on the circumstances of the case. The stronger and more rapid the growth of the foot the more is it necessary to cut away . If little horn is produced it is advisable to remove as little as possible. There is generally a far more rapid growth of horn at the toe than at the heels or the quarters. More will, therefore, be taken off there than from the other parts. It is necessary to shorten the toe and lower the heels, until the shoer succeeds in bringing down the bearing surface of the hoof upon the shoe to almost a level with the horn of the sole. The toe should be smoothed down level with a rasp. Portions of the sole and frog detach by exfoliation, as they become superabundant. The sole, therefore, would not need paring were it not for the restraining effect of the shoe upon the general functions of the foot, which is liable to prevent such detachment of the horn. The bars should not be confounded with the substance of the sole, and set down to the common level with the sole. The bearing of the bars should be equal to the outside of the crust upon the shoe. They offer a decided resistance to the contraction of the heels. Cutting away the bars to give the heels an open appearance should never be done. In a natural healthy condition the frog has a line of bearing with the hoof, and by its elastic nature, acts as a safeguard to the delicate machinery of the foot immediately over it, and helps to preserve the foot in its natural state by keeping the heels spread. Permitting the heels to grow down, with the addition of high-heeled shoes, raises the frog from its natural position and causes it to shrink and harden, resulting frequently in contraction of the foot. If the heels are square and high, and the hoof presents rather a long narrow appearance, and is hollow on the bottom contraction has begun. It is advisable to cut away until the level of the line horn of the sole is reached. If the foot is weak do not cut it away too much. The foot should be so dressed down and the shoe so fitted that the bearing comes evenly upon the crust all the way around without the sole touching the shoe. The corners between the bars and crust should be well pared out." In reply to questions, Mr. Richter said that in shoeing a horse that brushed he would leave the inside of the hoof higher than the outside. The shoe should be left wide at the heel to allow of expansion. Generally portion of the frog had to be cut away. Burning did not damage the foot if all the charred horn were cut away. Messrs. D. and. L. McCallum thought it advisable for the farmer to learn how to put a shoe on a horse.

WIRRABARA (Average annual rainfall, 18·91in.).

April 11th.—Present: 18 members and three visitors.

Grubbing.—A paper on this subject was read by Mr. W. Bowman. In the winter, he said, the clearest and most convenient tree within reach of the edge of the timber should be selected for use as an anchor to hold the grubbing machine. The tree to be pulled up should be eased in front, in order that the taproot would not split up. If necessary, a few of the back roots should be cut also, but always far enough below the surface to ensure clearance for the plough. A pickaxe, round-mouthed shovel. and a good axe were the tools necessary. The trees nearest the anchor should first be pulled. The chain should be placed as high up the trunk as was possible without danger of it snapping. The hook, or ring, should be at the side of the tree, otherwise the strain was likely to break it if the chain were pulling from the centre of the tree. When the tree was about to fall, a log should be placed in front of the butt, this would then be lifted right out of the ground. The horse-power grubber with wire ropes was the best. In this district a machine should stand the test of 20 tons. Wire rope was more satisfactory than iron bars. A pulley block was a great advantage when heavy timber was to be dealt with. It was decided to hold a trial of the different grubbing machines to determine their relative merits.

CARRIETON.—Messrs. Bock and Kaerger were appointed to conduct experimental plots on behalf of the Branch.

DAVENPORT, April 2nd.—The Chairman (Mr. Holdsworth) summarised the information which had appeared in the *Journal of Agriculture* during the past few months on the subject of the immigration of farm lads. Members discussed the question, and commended the action of the Government in this connection.

MORCHARD, March 7th.—Fodder Conservation. The Chairman (Mr. J. Scriven) tabled samples of straw and self-sown hay, cut five years ago. Both were sweet and sound. Chaffed, and mixed with good hay chaff, this had been fed to horses, which did well on it. Mr. Kupke had made a practice of conserving cocky chaff and straw every year, this had been very valuable to him during the present season.

MORCHARD, April 11th.—Farm Outbuildings.—In a paper dealing with the erection of outbuildings on the farm the Hon. Secretary (Mr. B. S. McCallum) said that about this time was the best to give attention to such fixtures as the stables, barn, ensilage pit, blacksmith shop, fowlhouse, and pigsty. Stone and concrete would be found very suitable for making good strong walls. The concrete should be made from one part lime and three parts gravel, from which all the large stones had been sifted. After mixing it should stand for at least three hours. Planks 12in. by 2in., the length of the wall, should be placed in position, and about 2in. of concrete should be run between these. Stones should then be packed in; if these were of good face, tight against the planks, but if they were rough in the centre of the wall, between the planks. Concrete should then be run between the stones. Every second day an additional layer of this nature could be added to the wall. Whilst iron was more expensive for roofing there was less risk of fire with it than when straw was used. Mr. W. Toop preferred the concrete and stone walls as the cheapest if the stone and gravel were at hand. Stables should be well ventilated, but machinery sheds needed to be closed in well. Iron was best for roofing. Mr. W. H. Toop concurred, as straw roofs provided excellent nesting grounds for sparrows, In reply to Mr. E. J. Kitto, the Hon. Secretary said that stone and mortar building required an experienced workman, whilst concrete walls could be built by any handy man.

WARCOWIE, April 6th.—It was decided to conduct manurial tests on an area of fallow kindly offered by Mr. Telfer. Messrs. Donnellan, Ryan, Jarvis, and Feineler were appointed a supervising committee.

WEPOWIE, April 18th.—The delegates to the Upper Northern Branches Conference delivered interesting addresses regarding the proceedings of that gathering.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

BEAUFORT.

March 16th.—Present: 11 members and four visitors.

SEED WHEAT.—Mr. J. Sampson read a paper dealing with the "Treatment of Seed Wheat." He did not think either rust or takeall could be prevented by treating the seed, but 1lb. of bluestone in sufficient water to wet three bags of wheat would effectively prevent smut. The floor method of pickling was best. The best varieties for this district were Gluyas for early wheat, and Marshall's No. 3 and Federation for late. It was always advisable to put seed through a winnower to clean it of dirt and dust. The Chairman (Mr. W. W. Mugford) agreed. He noticed that red rust was more prevalent in wet years. Mr. A. Yard thought wheat drilled in when it was wet was more likely to be affected with smut. Mr. C. G. W. Underwood advised sowing rust-resisting wheats. A visitor mentioned that hard-strawed wheats were less subject to the rust fungus than the soft-strawed varieties. A 1 per cent. solution of bluestone was the best pickle for smut. It was pointed out that if there were enough moisture in the soil to cause the germination of the smut spores, but not the grain, the smut would die for want of a host plant.

CONSERVATION OF SOIL MOISTURE.—Mr. J. Nicholls, of the Nantawarra Branch, delivered an interesting and instructive address on this subject.

BEAUFORT.

April 9th.—Present: 11 members and four visitors.

SEEDING.—Mr. H. C. Underwood read a paper. He said "seeding operations should not be skimmed over. We are well into April, and those of us who are growing oats for hay should be on the move, so that we are ready to start on the wheat as soon as the first rain comes. One bushel of oats to the acre and about 56lbs. of second grade super. will grow a very good crop on stubble land. Wheat should be planted on fallow ground for the best results. After rain we should not be in too much of a hurry to get to work with the cultivator, especially after a heavy fall, but allow the weeds to come up and then work it to a depth of 1½in. to 2in. A light set of harrows is very good behind the cultivator if the weeds are very strong or the ground very uneven. The drill should not be let into the ground to its full depth, but so that it is running along nicely and covering all the seed. One bushel of wheat to the acre is enough, but if sowing in dry weather it might be sown a little thicker, because some of it may not germinate. The seed should be well cleaned and pickled with bluestone solution at the rate of 1lb. to 10galls. of water. Be very careful not to mix it stronger, or a bushel to the acre less at reaping time may result through a percentage of the seed not germinating. Marshall's No. 3 returns a very good yield when sown early, but it is rather late for this district, on account of hot winds. Gluyas is a very good early wheat to sow late. It is unwise to plant more of this than can be taken off quickly, as the first strong wind that comes along causes it to go down. Gluyas Late is a much thicker strawed wheat, and stands the weather better. Farmers in light scrub country should not give the land a heavy dressing of super. or the growth of the wheat will be so soft that the first trying weather will scorch it. The light scrub ground does not retain the moisture as the heavy soil does. On this class of soil it is not advisable to put on more than 90lbs. to the acre of Standard super. Those who are farming heavy country usually put on 1cwt." Mr. A. Yard thought that 56lbs. of super. on stubble ground for oats was too much; half that quantity was plenty. Sixty pounds of super. was sufficient to grow a good wheat crop. He always used high grade super. Mr. C. Wilson thought 50lbs. super. sufficient for oats, sowing about a bushel of seed to the acre. I.X.L. was a very good wheat, a little earlier than Marshall's No. 3, a good yielder, and very good for hay. Mr. J. Dahse thought I.X.L. rather light for hay, but a good wheat yielder.

The Chairman (Mr. W. W. Mugford) thought that where weeds were very bad it was a good practice to wait for rain before sowing. It was advisable to give the land a good dressing of super., as the benefit of it was secured in the feed if not in the wheat. Marshall's No. 3 seemed rather late in ripening. Gluyas, in his opinion, was the best wheat, but it had a tendency to go down very badly. He thought there was a great tendency for wheat to degenerate, therefore great benefit was derived from such places as the Agricultural College and experimental plots, as they all help to keep up the standard. Mr. G. Underwood agreed that 56lbs. of super. was the best dressing for oats. He had experimented with less, but had not had such good results. Oats should be cross drilled, putting on about 80lbs. to the acre. At seeding time it was not advisable to cultivate too deeply, as that only stirred up the subsoil that had been packed during the year. The skim plough worked about 2in. deep before the drill was the best weed killer, and it made a nice seed bed. Usually in starting seeding he put in some late varieties of wheat and left the early wheat to be put in later. It was better to sow a little of some early variety, such as Triumph, which stooled well and would prevent land from drifting, which would come in handy for feeding off. He thought Marshall's No. 3 a good wheat; also King's Early for an earlier variety. He had not had satisfaction with Gluyas. Ninety pounds of super. to the acre in his opinion would give the best results. Thicker sowing and cross drilling would pay well for the extra work. Mr. C. Veitch would cross drill wheat. He did not think farmers could put on too much super. It was a great advantage to cross drill oats. He had had the best crop of oats he had ever seen by sowing 1¼bush. seed and 70lbs. super. Mr. T. Warner had pickled barley with 1lb. bluestone to the bag and had no smut. Mr. A. Yard had smut in barley in abundance after using the same strength of pickle.

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.)

April 16th.—Present: eight members.

Intense Culture.—Mr. A. H. Jacobi read a paper. He said:—"Every acre of our holdings should be put to its best use. The ploughable land should be broken up and cultivated with wheat, oats, barley, and rye, as all these give a handsome return even in the poorest years. The rough country could be sown with wattles for bark. Sugar gums, pines, and other useful timber should be planted on the rough patches and creeks, as they will come into use later for fencing and building. Low-lying sandy flats may be put to a better use than any of the above mentioned. Fruit trees of any description should be planted and looked after. With a little care a large return will come from a few acres of these. Vines can also be added, and if wine cellars and a distillery were established here hundreds of acres which are too steep to culitivate could and would be planted with wine grapes. Where a plentiful supply of water is obtainable tomatoes, potatoes, melons, and summer vegetables can be produced in large quantities. I have been told by bee keepers that bees do exceedingly well here. With careful management both wool and lambs can be raised to a high standard by feeding them on lucerne. This district I consider is well adapted for poultry raising, and with a market like Port Pirie available they are worth far more attention than most of us give them."

Vegetables.—Mr. J. Ryan read a short paper. Vegetable seed he said, should be procured from reliable sources. The seed bed should be well manured and watered, and free from weeds before planting. Root vegetables should be put into soil dug to a depth of 1ft., and well dressed with stable manure. Fairly thin sowing was necessary in order that the plants should root well. Onions should be put into sandy soil, and kept well hoed up. Cabbages and cauliflowers should be put in about 2ft. apart in the rows, with 2ft. 6in. between the rows. Hoeing up and watering were necessary. Peas, tomatoes, cucumbers, and melons all did well in this district.

GEORGETOWN (Average annual rainfall, 18·32in.).

April 11th.—Present: 17 members.

Barbed Wire Cuts.—Mr. J. Fogarty dealt with the subject of cuts caused by barbed wire. The method of dealing with these, which he adopted, was to sew the edges of the wound together with a thin darning needle and strong thread, such as Belfast thread. He had tried all sorts of oils as dressings, and was quite satisfied that a light solution of bluestone was as effective as anything. Generally, members preferred a mixture of ½ dram of iodine and a bottle of methylated spirits.

Preparations for Seeding.—Mr. J. H. Buchan read a paper. Whilst it was admitted that different soils required different treatment, he said, the greater part of the land in this district was of a loose nature, and responded very well to summer fallowing. During one year he treated different portions of one paddock as follows:—One part was ploughed in winter, was cultivated twice, and then scarifier-harrowed. The other part was ploughed in summer, was harrowed, cultivated, and twice scarifier-harrowed. Although the former entailed extra work the crop from the latter was cleaner and better. Ploughing should be done in winter to a depth of 3in., but summer ploughing should be from 4in. to 4½in. deep. The land should be left as rough as possible, the weeds being kept under with sheep until the end of August, after which the harrows and cultivator should be used as frequently as necessary, in order to conserve moisture. He had found that harrowing from four days after drilling until a month after the plant was through the ground ensured a better crop than that from land not so treated. The best time to harrow was between four and seven days after the seed had germinated. All members favored early fallowing, but opinions differed as to whether the land should be cultivated at once.

GLADSTONE (Average annual rainfall, 16in.).

March 28th.—Present: 13 members and one visitor.

Depreciation of Farm Stock and Implements.—Mr. T. Hollitt read a paper. A team of, say, 10 horses, purchased at 4 years old at £30 per head, he said, would not fail in so far as work was concerned until they were about 12 years old, but their selling value would depreciate at the rate of about £2 per head per year. This would equal a loss of £200 in 10 years. The best practice to counteract this was to breed from the best mares, using a sound entire, and feeding the young stock well. Light work only should be performed by horses under 4 years of age. Shares of the ploughs and cultivators were the source of considerable expense; the best means of minimising this was to work the land only when it was in good condition. The wagon should be screwed up, painted, and oiled at frequent intervals, similar attention being given the drill, binder, harvester, and suchlike machinery.

LAURA (Average annual rainfall, 18·02in.)

April 3rd.—Present: large attendance of members.

Mixed Farming.—Mr. W. Stevens read the following paper:—"With such changeable seasons as we have in Australia it does not pay to rely only on one kind of crop. I have known some farmers put in 1,500 acres several years in succession and not reap their seed. In our own district there are still a few who rely on wheat and hay, but there are also a large number working on the three years rotation, which seems to be a good principle. Some have affirmed that mixed farming is a failure, but many of our wealthy farmers have been following it for years with success. Every farmer should keep a few sheep. A farm of 640 acres should be able to carry over 100 breeding ewes. It does not pay to overstock in a district where the growing of summer crops is not to be depended on. It will pay farmers to gather part of their stubble, as a stack of straw is always useful. Cropping the hay ground with early feed, such as barley or rape, or anything which will grow quickly, will prove beneficial, as with it, if early rains come, part of the ewes and lambs may be fattened. It will also pay every farmer who has stock to buy a few pounds of lucerne, and when drilling wheat sprinkle a handful of lucerne seed in the drill box with the manure when sowing a choice piece of ground. This in a good season will make good feed with the stubble. Every farmer with a family should keep about six cows, which, if fed well, will turn in a nice cheque every month for cream. The profits depend on the feed. It pays to have a silage pit which can be filled before the hay is cut. In favorable seasons a small plot of sorghum, maize, or thousand-headed kale is good, but it must be fed with care. Wheat chaff damped with hot water and molasses mixed with bran, oil cake, or crushed corn, makes good feed. From 50 to 100 hens of a good laying strain should also be kept. If these are well fed they will return a nice profit and can be looked after by the farmer's wife and family. One or two breeding sows with a litter or two a year sold at the present prices will prove very profitable. They can be fed with skim milk, any grain, and green feed. In addition to the horse stock necessary to work the farm there should be a few good mares for breeding. If two or three foals are bred every year they will come in very handy to replace losses or to sell. Young stock should be worked for a few years and sold in their prime. It pays to feed all stock well. A small plot of barley or oats will prove profitable. Some say that this involves too much work, but if done at the right time, one thing following another, the farmer can find work for his employés all the year round. Every farmer should have a small garden in which to grow vegetables for home use, but it will not pay to grow fruit, as the birds are so troublesome. A blacksmith's and carpenter's shop should be on every farm. On wet days a farmer can do a lot of repairs which will save considerable time and expense. An interesting discussion, in which Messrs. R. Lines, G. Bundey, E. C. Blesing, J. F. Roennfeldt, W. Wilson, and J. Sibly took part, followed the reading of the paper.

MOUNT BRYAN (Average annual rainfall, 15·81in.).

April 1st.—Present: about 25 members and visitors.

The Breeding of Ewes for Raising Freezers.—Mr. C. E. Birks, member of the Advisory Board, read the following paper:—"In writing on this subject I do not wish it to be thought that I claim to be an expert, but as one who has some practical experience in raising freezers on a small scale on the farm, I have a little knowledge as to what is required in the way of a mother for the fat lamb, and in so doing would offer you a suggestion for an improvement in the lamb industry so often advocated by Professor Lowrie, backed up by many experts in the handling of sheep, and which in New Zealand is a regular business in itself in certain parts of the country. It is very questionable whether there is anything in the way of stock more payable on the average farm than a flock of good breeding ewes, and to make the most of them too much care cannot be exercised in the breeding or selection of these ewes, so many things have to be taken into account to get the best return for the outlay, and the time has come when farmers are alive to the fact that every animal must produce its share of profit, and the more carefully the flock is chosen the greater that profit will be. Nothing puts a lamb buyer off more than a want of uniformity in the size of lambs; given lambs in the pink of condition, but uneven in size, I make bold to say that they would bring less than an even mob, whose actual weight was only equal to the uneven mob, to say nothing of the satisfaction to both buyer and seller in dealing in something that is a pleasure to look at. This point applies particularly in the case of the small farmer who has not enough lambs to draft up into, say, three grades. Of course, with the larger man he can sell according to size and quality to better advantage. Now, it is one thing talking about what we want in the way of ewes, but another to get them. We all know what competition a good line of breeding ewes draws when advertised for sale, and how farmers will go shillings per head more for an even well-woolled line as against the line composed of mixed sizes and shapes. *Where the ewes are to come from.*—It is practically impossible for the farmer to breed his own ewes and attain the high standard of type and uniformity that is required to send off in one line a big percentage of the lambs as freezers. It is in this direction I wish to throw out the suggestion to men whose holdings are on the edge of the farming districts, and who go in for, say 3,000 sheep and upwards, that they pick out as many of their big-framed, good constitutioned, well-woolled Merino ewes, mate them to the Border Leicester rams, or failing them, the Lincolns; keep the best of the ewe lambs and put them on the market as two-tooths to be mated on the farms to Southdown or Shropshire rams to produce freezers; or one can with advantage cross again with Border Leicesters, thus getting a three-part Border Leicester. The second-rate ewe lambs and wether lambs from the first cross can be disposed of as freezers or hoggets; but get them off, only keeping on each year with the Merino-Border Leicester or Lincoln. This cross makes a good framed and constitutioned ewe, a good mother, and just about the ideal ewe for producing fat lambs, and the wool will be as paying a proposition as any crossbred sheep you can name. In New Zealand a regular trade with these breeding ewes is done, and when a farmer wants to go in for fat lambs he can, by paying a high price (and it pays him to do it), buy ewes of the right sort to breed from instead of breeding from a mixed lot as to type, size, age, and breed. Very often from a good class of ewe bred in this way the farmer can safely rely in fair seasons, especially with the aid of some barley, oats, rape, kale, or mustard, on getting 90 per cent. to 95 per cent. of freezers, and he will be very glad to keep the other 5 per cent. to 10 per cent. for ration sheep. I trust this paper will be freely discussed and that some good may come out of the discussion, and not end at the termination of the meeting. There is money in it to the sheepfarmer, and it will supply a long-felt need of the farmer who only has room for 200 to 600 sheep, and the raising of fat lambs is a most profitable venture, especially from ewes of this class, whose wool, I might say, on the authority of Mr. H. Jackson, the Wool Expert, is of the best crossbred class and sells well at any time." A good discussion followed.

Bureau Work.—The Secretary of the Advisory Board (Mr. G. G. Nicholls) spoke on this subject. The man on the land, he said, was continually faced by more or less serious problems which had to be elucidated to enable him to make the fullest use of his opportunities. By meeting regularly together, stating their successes and discussing their difficulties, the members of the Bureau assisted each other tremendously. The Bureau had something more than a mere name to offer them. As an outcome of the Farmers' Congress in Adelaide in September, 30 odd Branches had undertaken to conduct various field experiments in their respective districts, and it was generally felt that much good would result therefrom. The Mount Bryan Branch had performed valuable work, but there was still a lot to be done. He advised the appointment of a programme committee to prepare a programme to cover the remainder of the year. Every meeting should be adequately provided for. Homestead gatherings should be encouraged; one meeting should be devoted to discussing harvest results and the means by which they had been obtained; and there should also be a "social night," which the ladies of the district should be invited to attend. They would find that by systematising their work as a Branch the effectiveness of the meetings would be materially enhanced, and the individual members would be greatly benefited.

NORTH BUNDALEER (Average annual rainfall, 16·15in.).

April 8th.—Present: 16 members and two visitors.

Pickling Seed Wheat.—Mr. W. Burgess read a short paper on this subject. He deplored the carelessness that characterised the treatment of seed wheat by many farmers. He advised the floor method of pickling with bluestone, mentioning that the practice of immersing the bag of grain in the solution by no means assured that every grain was thoroughly wet, which was the only means of ensuring the destruction of the smut pores. Mr. Pollard had for years used a 1 per cent. solution, but last year this was reduced to ½ per cent., and his crop was quite clean.

The Homestead.—Mr. Smart contributed a paper on the laying out of the homestead.

PORT GERMEIN (Average annual rainfall, 12·84in.)

April 18th.—Present: 10 members and two visitors.

Seeding.—Mr. Holman preferred sowing wheat after rain. The year before last he commenced sowing about the middle of June. That sown during the first fortnight went up to 21bush. If the rainfall were good it was better to sow wet. Usually dry sown wheat was subject to black rust or take-all. Mr. Stone also preferred sowing wet, or working the ground over to conserve the moisture. To harrow the fallow ground just after rain was a great advantage. Mr. Carmichael thought wheat sown after rain would produce a greater yield. Messrs. Deer and Crittenden also advised early sowing.

SPALDING (Average annual rainfall, 20·25in.)

April 11th.—Present: eight members.

Noxious Weeds.—Mr. S. Hennessy contributed a paper on this subject. He had come to the conclusion that where star thistles had obtained a good hold it was practically impossible to eradicate them. Sometimes he thought he had successfully cleared his land, as very few thistles had grown for about three years, when, after a heavy March rain, they again appeared in large numbers. Two years ago he had a large number of star thistles in his crop. He cut portion of the crop for hay, cutting the thistles also, and no seeds fell. The other portions of the crop he left for the harvester, and the weed seeds were allowed to fall. On the portion which had been cut for hay a large number of thistles grew the following year, and on the portion harvested there were very few weeds. He thought that the seeds remained in the ground and grew when the soil was in a fit condition. Where star thistles were in fallow, the more it was worked the more trouble they caused the following year. He advised fallowing it, harrowing, and then turning sheep on to the land. He usually waited for rain before putting it under crop. On pastoral land the star thistle made good fodder for sheep at this time of the year. To clear stinkwort from land intended for cropping the fallow should be cultivated in the preceding spring. Charlock did not appear to thrive in the district, but he made a practice of pulling it out of his crop each year. He had noticed a few patches of Salvation Jane about the roads, but it did not seem to spread. In the discussion, Mr. Campbell stated that the weed locally known as the star thistle was the Californian thistle, the former being almost unknown in the district. Members generally agreed with the writer of the paper, and thought that the stemless horse thistle should be placed on the noxious weeds list.

YONGALA VALE (Average annual rainfall, 13in. to 14in.)

April 4th.—Present: 11 members and four visitors.

Handling Wheat in Bulk.—Mr. Lock, of the Whyte-Yarcowie Branch, read the following paper:—Much has been written on this subject of late, and we are all fairly well acquainted with the pros and cons of the question. I have a few words to say, however, on the statement prepared by the departmental officers, and read at the Gladstone Congress by the Minister of Agriculture, as reported in the March issue of the *Agricultural Journal*. This statement goes into the cost of the two systems, and goes into figures to such an extent that I venture to suggest that the majority of farmers who have read it have been lost in a maze of decimals. In the end they have probably been little wiser as to how the conclusion is reached that the adoption of bulk handling in South Australia would cost approximately ·26d. or ¼d. per bushel more than the present system. However, that is the position taken up, and it would not be surprising if it proved to be right, considering the fact that it is usually a much easier and less expensive thing to stick to the old way than it is to initiate a new system, and one which we have to become accustomed to before it can be worked in the most economical manner. But before we accept the above statement as correct there are a few things to be considered. In the first place, they base their estimate on a 6d. bag, whereas the fact is that last harvest bags were as high as 8½d., and even if we say the average price was 7d., that will at once make up more than the difference of ¼d. per bushel, for we must remember that however high price we pay for bags we only get the same amount if we sell them as wheat. *Life of the Bags.*—Furthermore, there is the matter of the life of bags, which the report puts down at two years; well, every farmer knows that many, and even most bags will last considerably longer than that, without any very special care being given them, so that the life of bags might be fairly put down at an average of three years, which would again considerably reduce the estimated cost of the suggested modified system. Then, again, they base their estimate on a tied bag, which would hold 10 per cent. less than sewn. Well, why not sew them? It would cost very little more, and sewn bags are much more easily handled and safer to transport. *Effect on Marketing.*—They go on to say that the whole advantage of the bulk system appears to be (1) the saving of waste, and (2) in relieving the farmer from alleged disabilities imposed by the wheat buyer. This is a very short-sighted view, but probably the compiler is unaware that the adoption of bulk handling would entirely alter our system of marketing, as well as handling. In fact, the system of marketing thereunder is far more important than that of handling, for under it we would be able to export a clean sample of different certified grades, and each farmer would be able to sell on quality, and would get the full value of his product. As it is now, the farmer who cleans his wheat is really worse off than the other who sells a dirty sample, but up to the standard. The system of marketing on the f.a.q. sample, is not a quality system at all, as far as the farmers are concerned. It is certainly all right for the merchant, for he can mix the lot together, but that is no use to the farmer who grows the good wheat, and who takes the trouble to clean it well; whereas under the bulk system several grades would be recognised, and the farmer would sell on quality. *Facilities Needed on the Farm.*—Now, how can the farmer manage without using bags, providing that means are provided for transport and storage in bulk? Certainly, our system of harvesting, *i.e.*, the harvester, does not lend itself to the handling in bulk as well as the American—*i.e.*, the threshing machine; but the difficulties are very far from being insurmountable, and considering the big item, as cost of bags each year, it is safe to say that in, say, five years the farmer would find himself well in pocket after supplying proper and permanent means for dealing with wheat in bulk at home and in the fields. The cost of bags to a farmer who reaps 2,000 would be, at 7d., £60; for which he would receive, sold as wheat, about £12 10s., thus showing a loss of £47 10s. on one year's harvest, and on five years £237 10s., surely more than sufficient to provide facilities for handling in bulk, which would last considerably longer than five years. One essential thing would be a good barn—which most up-to-date farmers already have, and which would need only minor alterations and additions. Then a box wagon, which only means fitting sides and ends on to the present wagon or trolly, and which would, of course, be movable, as our hay frames are. Then, say, two receptacles of strong frame and galvanised iron on wheels to hold about 500bush. each, which could be run out into the paddocks adjacent to the crop, and into which the wheat would be deposited direct from the harvester, pending removal per box wagon to either barn or railway station on damp mornings, or any other convenient time. This would entail a little more travelling with the harvester, but the speed with which the harvester box would be emptied would make up for that. Of course, these receptacles would be portable, and when empty could be moved from place to place. Small portable hand elevators would be sufficient for use in the paddocks, whilst at the barn a larger elevator, worked by either horse or motor power, would be necessary. Some such scheme, I am sure, would be practicable, and would doubtless result in eventually saving the farmer a considerable amount on the cost of bags. *Progress, with Caution.*—Of course, if the price of bags were likely to go down to a reasonable thing, or wheat go up, there would not be so much need for attempting to do away with them, but such is not at all likely, for the cost of material and labor is increasing. Even so, the numerous advantages to be gained under the bulk system of marketing—which the older wheat-growing countries have certainly found to be to their advantage—would still be more than sufficient inducement for us to go for it. Now, I never did, nor do I now want to see South Australia rush madly into this alteration—although it must come sooner or later—yet I want to see the question receive the consideration it deserves, and not silenced simply by a departmental report which is, however, conscientiously prepared, pandering to the inherent conservatism of human nature, and simply preaching the doctrine of 'leave things alone,' they are good enough as they are, which, in a progressive country like ours, should not be tolerated. There appears to be a grave danger that the question of bulk handling may become a political party question; this must be avoided at all costs, for it is very much purely a farmer's affair, and has nothing to do in particular with either political party." Mr. Pearce, of the Whyte-Yarcowie Branch also spoke in favor of bulk handling. A strong point in favor of the system was that it would enable the farmer with the better sample of grain to secure a higher price for it. Mr. I'Anson contended that this could and should be done under the present system by grading the wheat into different qualities.

MOUNT BRYAN EAST, April 7th.—The Chairman (Mr. J. Thomas) delivered an address on the work and aims of the Agricultural Bureau, which was much appreciated by members.

MUNDOORA, March 20th.—Handling Wheat in Bulk.—Mr. G. M. Wilson read a short paper. This system, he said, was being successfully carried out in other countries, and South Australia was not up-to-date in the matter of wheat handling. Messrs. Browne, Button, Stephenson, and Clothier spoke in favor of the system.

NARRIDY, March 21st.—Messrs. W. F. Nicholls and R. Satchell reported on the proceedings of the Conference of the Northern Branches. The latter gentleman stated that he mentioned to the Dairy Expert the case of a cow kept in good condition through the dry summer, then turned on to good green pasture, and which died from dry bible within ten days. The Dairy Expert's answer, he said, was that the cow died from shock, which he characterised as ridiculous.

[The shorthand record of Mr. Suter's remarks shows that he said he could not hazard a guess as to what caused the death in cases where he had not seen the beast; it might have been due to shock or any other causes.—Ed.]

SPALDING, March 27th.—Selection of Farm Implements.—Mr. H. A. Gill read a paper on this subject in which the good and bad points of various implements and machines were compared, especially in view of their suitability for different classes of country. [We regret our inability to print this paper, as the use of makers' names would necessitate giving the former an opportunity of replying.—Ed.]

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16·46in.).

April 4th.—Present: 22 members and seven visitors.

Stock-Raising.—A paper on this subject was read by Mr. J. T. Harmer. The following is extracted therefrom:—"During the last 50 years greater results in the breeding of all farm animals have been accomplished and greater progress towards perfection made than ever before. Many farmers suppose that animals may be exposed to the storms of winter without serious detriment. No mistake could be more fatal to the stock raiser than this. An animal that barely survives the winter seldom more than regains during the next summer the flesh lost. No farmer should keep more stock than he can feed properly. One well-kept beast is worth more than three poor ones. In fact, if I go out to buy cattle or sheep, I can always rely on getting something good from the farmer who does not overstock his farm. The only profit there is in stock raising of any kind is made by keeping them steadily growing until they reach maturity. For once an animal is stunted in growth it never gains much weight afterwards. No money was ever made by neglecting or starving farm stock. It is better to get rid of some of the stock than to feed the pasture too close. Animals that have to busy themselves all day to satisfy their hunger never come out fat. If farmers have provided for contingencies by means of fodder they may, of course, stock their pastures closer than otherwise. It is just as cheap for the farmer who only fattens a few head yearly to make prime cattle as it is for the one who fattens hundreds. In fact a man who fattens but a few head should make better cattle. For the two purposes of milk and beef combined, I believe the milking strain of the Shorthorn cattle is the best. The cow that is not a good milker can be sold to the butcher, and as Shorthorns are mostly heavy-weight cattle one can always demand a fair price for them." Mr. McEwin mentioned the necessity for keeping the dual purpose cow in this district, and Mr. Pratt expressed a preference for the Shorthorn.

Experimental Plots.—A committee to supervise demonstration plots was appointed, as follows:—Messrs. W. and J. Pratt and J. Williams. Messrs. A. L. McEwin, C. P. Schuster, and H. Hamilton undertook to conduct manurial tests, and Messrs. J. T. Harmer and M. Williams wheat variety tests.

FRIEDRICHSWALDE (Average annual rainfall, 18in. to 19in.)

April 4th.—Present: five members and two visitors.

The Erection of a Homestead.—Mr. F. W. Duldig read the following paper on this subject:—"After purchasing an unimproved farm the first point to decide is a suitable place to erect the homestead. This should be put near a main road, as it is very inconvenient having a lot of gates to open, especially if a person is driving spirited horses. The house should be built of stone or brick, having high walls and plenty of ventilation. If possible the front should face north or even south, thus avoiding the sun shining on the doors and windows, and the rough westerly weather does not beat into the house. For the stable I prefer galvanized iron walls and a straw thatch roof. Gum forks, 8ft. high outside and 11ft. 6in. in the centre, giving a 3ft. 6in. pitch should be used. It is a big mistake to have a wide span between the forks. Stretchers, 5in. in thickness, and rafters 3in., with No. 8 wire drawn across are lighter and better than extra timber to keep the straw on. It is a good plan to attach a chaff house to the stable for convenience in feeding the horses. An implement shed should be five or six chains away from the stable. It is not advisable to have all the sheds connected, owing to the danger of fire. Cow yards and pig sties are best built apart from the rest of the sheds. The poultry shed should be of galvanized iron. The blacksmith shop and tool house may be built of stone or galvanized iron, apart from the other outbuildings. Water for the stock should be as handy to the homestead as possible, and always available. If stock have to be driven to water they very often have to go all day without sufficient drink, especially if worked on roads."

GAWLER RIVER (Average annual rainfall, 17in. to 18in.)

April 17th.—Present: nine members.

Fodder Crops.—Mr. P. T. Hill read a paper on this subject. Lucerne, he said, stood foremost as greenfeed. Variety, however, was an important point in feeding stock, and the best method of proving this needed consideration. "There are numbers of suitable fodders, such as rape, kale, silver beet, barley, oats, Egyptian clover, &c.," the paper continued, "but for this locality with its, say, 18in. rainfall annually recent experience seems to point to rape as deserving a place second to lucerne amongst food plants. It may be described as a member of the cabbage family, growing from, say 10in. to 15in. in height. It is renowned for its crisp and succulent nature. It is not a deep-rooting plant, therefore does not stand the heat as well as lucerne. If eaten close to the ground during excessive heat many plants die, and most likely if stock run on it it will require replanting after the second year. It is much liked by stock, and does not in any wise taint milk or butter. In winter, when lucerne makes slow growth, the rape is the most vigorous, consequently in Europe, notably in England and Germany, it is freely grown for cattle. Oilcake made from it is well known for its fat-forming qualities. Last year on a Gawler River farm a few acres were sown with rape which gave splendid results, for whilst most dairy cattle in the district were reduced to skeletons owing to the scarcity of feed those favored with the freedom of the rape paddock were fat and sleek. The crop mentioned was, through necessity, fed down too closely, and during the heat of the dry summer following a dry winter much of it died. Last year's crop upon the river flats was such a marked success that the same alert farmers are this year planting a much larger area on the higher lands. It cannot be expected that the higher, lighter, and drier lands will yield a crop to compare with that upon the better soil of the flats upon the river frontage. Last year two small plots were sown on the dry land back from the river about a quarter of a mile. No. 1 was not watered artificially and yielded a light crop late in spring, but suffered severely from the summer heat and died down, but fully one-third of the plants sprang into life after the rains of February 27th, and at the beginning of April yielded a moderate cutting. No. 2 was watered with Barossa water, and during the same period gave five fine cuttings. Only 5 per cent. of the plants succumbed to February's heat. The tenderness of those plants was such that poultry devoured them greedily. It was fed in rotation with lucerne and kale, and the decided success attending past operations strongly recommends it for the future."

JULIA (Average annual rainfall, 18in. to 19in.).

April 11th.—Present: 13 members and three visitors.

Wheats for District.—Mr. G. Gaerth contributed a paper on this subject, in which he stated that farmers should take careful notice of the soil and climatic conditions of the district when selecting wheat for seed. They should retain over harvest more wheat of both early and late varieties than they were likely to require for sowing. When the season opened they should select the varieties intended for sowing, with due regard to the conditions which promised during the year. Seed should not be discarded if it did not prove successful in the one year. For testing new varieties a few acres were sufficient. The standard of the seed would be well maintained if farmers made a practice of selecting the best of heads from their crops and sowing these to provide future seed. He thought Federation the best variety for this district, and Florence, a newer wheat, promised well. For late varieties he favored either Yandilla King, Bluey, or Marshall's No. 3. Early varieties were best for hay. King's Early, Gluyas, and Baroota Wonder were very suitable.

Harrowing after the Drill.—Mr. C. Nash read a paper on this subject, in which he said that harrowing after the drill was a practice which, in this district, should not be neglected, especially where land was infested with destructive weeds. If this harrowing were made a regular practice it would no doubt prove a great success. It was necessary for each farmer to test the practice, however, as on one farm it might be suitable and not on another. He thought the best time to harrow was two or three days after drilling, but if land were being drilled during dry weather, this was not so necessary, but if it were wet or sticky the drill did not cover the grain as it should, and the grain was liable to perish if not harrowed. The best way to remedy this was to attach the patent self-adjusting harrows to the drill, which would be little trouble where the land was clean and free from rubbish. Should the weather prove favorable, however, the common harrows should be used, and the ground reharrowed across the drilling.

NORTHFIELD (Average annual rainfall, 19in.).

April 7th.—Present: eight members.

Harrowing.—Mr. D. Rowe read a paper. He said—"In the case of land which does not clean from the plough it is questionable whether the edges of the furrow should be broken to cover rubbish, or whether the harrow should be loaded to pull the rubbish to the surface. I am in favor of the former. The first harrowing should pulverise the soil, break the lumps (if any), and work to a depth of 1in. or 1½in., leaving the cultivator to make a seed bed. The reasons for this are that the ground has been ploughed when wet, and if harrowed when the surface is in proper condition, viz., the top a little dry, it covers the rubbish with earth. Rain following causes the rubbish to decay. If harrowed again two or three weeks after the rain the rubbish is too decomposed to be an annoyance. I am not in sympathy with loading the harrows, because it is too much like doing unnecessary work. Harrows, if loaded, frequently pull up lumps or clods, besides rubbish, which remains to be a nuisance for some time. I have known roots of bulldogs and stinkwort and branches of the same to remain in this way for 12 months after being pulled up. I have not seen any extra crop for the extra weight and work put into the land. Harrowing after the grain has been drilled has a good deal to do with the return of our year's labor. If we are fortunate enough to harrow when the ground is too damp for the dust to rise, and not wet, and dry enough to kill the rubbish, and we have a light rain of about 20 or 25 points six or eight days after sowing, and the plant gets strong before a heavy rain comes the prospects are good. Harrowing in the early part of the season can be done three or four days after sowing and prove very successful, and later, six or eight days after sowing." Messrs. Dall and Williams firmly believed in the usefulness of the harrows. Messrs. Kelly and Goldney preferred the cultivator.

SALISBURY (Average annual rainfall, 18·57in.).

March 24th.—Present: 15 members.

Experimental Plots.—Arrangements were made for manurial tests to be conducted by Mr. E. Tate, and variety tests to be undertaken by Mr. E. Moss.

Harvest Results.—Members presented reports of the harvest just completed. Generally it was agreed that the outstanding feature of the season was its exceptional dryness. Mr. E. Tate fallowed his land in June and July, scarified it twice before harvest and once again before drilling. Baroota Wonder wheat was sown on May 20th with 120lbs. of super. per acre; the average hay cut was 1¼ tons. Mr. W. W. Shepherdson ploughed during August; broke the land down well in the spring with the cultivator, and again in February after a heavy fall of rain. Wheat and oats mixed with 1¾cwts. of super.

was sown during the last week in May. The germination was irregular. The yield of hay equalled 15cwts. per acre, and but for a fall of rain in October, would have been worthless. The wheat was badly affected with red rust. Mr. E. Moss fallowed in August, harrowed, and later scarified his land three times. Heavy rains in February and March set the ground very solid, and it was scarified deeply in April, and harrowed before sowing at end of May, and rolled and harrowed after crop was up. Dart's Imperial wheat alone was sown on a small portion, and the same variety of wheat and Algerian oats on the balance. Mineral super. was used at the rate of 1¾cwts. per acre. The yield was about 25cwts. per acre. Some patches came up in due time after sowing and the rest from one month to two months later. Rust affected the wheat very badly, but the oats were free from it. Where wheat only was sown the rust was so bad that the hay was almost worthless. Where oats were mixed the wheat was not so badly affected and the hay was very palatable. Where there was wheat only the crop was good enough for 35cwts. to the acre. On this ground peas were grown two years ago instead of hay, and the difference in growth last season was very marked. Mr. F. C. Fleet fallowed to a depth of 3½in. in July, 1912. Part was harrowed twice before the cultivator in September. The harrows again followed, and the wheat was drilled in with 5cwts. of gypsum per acre during April. Portion was cultivated and harrowed, and drilled on June 10th with about 3cwts. gypsum, the harrows following; Dart's Imperial wheat and oats mixed were sown. The result was a cut of 15cwts. hay per acre. Mr. J. A. Short fallowed in July and August, scarified during September and October, scarified shallow in February and drilled with 1cwt. Thomas' phosphate and shells mixed. The greater part was sown in May with oats ½bush., Baroota Wonder ½bush., and Le Huguenot ½bush. mixed, a total of 1½bush. with 1cwt. of guano super. to the acre. One small paddock was sown with Majestic and one with King's Early and Golden Drop mixed. Germination was very uneven, some of the wheat malting and some germinating very late. The mixed oats and wheats gave a much better return for hay than that sown with wheat only. The wheat sown by itself was affected with red rust, while wheat mixed with oats was practically free from rust. Mr. H. Bussenschutt ploughed in the winter, cultivated two or three times in the spring, and again just before seeding. Baroota Wonder and Le Huguenot wheats mixed with oats were sown in May, with from 1cwt. to 3cwts. of bone super. per acre. Shells had been put on part of the area sown twenty years ago, the cost of the shelling being £2 per acre. The portion so treated gave the best results this year. Mr. T. H. Judd commenced fallowing in July to a depth of from 4in. to 5in. The land received frequent working prior to seeding. Baroota Wonder, Correll's, Dart's Imperial, and Le Huguenot wheats were each sown with oats, about 1½bush. of seed per acre. The part fallowed early yielded about 35cwts. hay per acre. and that fallowed later from 15cwts. to 20cwts. Land on which Le Huguenot wheat had previously been grown did not yield so well. Dart's Imperial and Correll were badly affected with rust, Baroota Wonder was slightly affected, but the fungus did not affect the Le Huguenot. Mr. W. J. McNicol's cropping area was ploughed between June 20th and July 30th, cultivated in August and October, and part again in November. Seeding commenced in the first week in June, and finished in the first week in July. Baroota Wonder, 1¼bush., mixed with oats. ¼bush.; King's White, 1¼bush., and Golden Drop, 1¼bush., mixed with oats, ¼bush. were sown. Super. at the rate of 125lbs. per acre was applied, except to the King's White, which received 100lbs. The harvest, which yielded three-quarters of a ton hay per acre, and 6½bush. of grain (King's White) was the poorest experienced for 16 years. Baroota Wonder did best.

SALISBURY (Average annual rainfall, 18·57in.)

April 7th.—Present: 12 members.

Sheep and Forage Crops.—The address delivered by the Director of Agriculture on this subject, reported in the March issue, 1914, page 856, was read and discussed. Members thought that hay at 35s. per ton could be more profitably fed to stock than sold. Whilst this would entail more work the stock would improve the land. Sheep would fatten on chaff. Mr. Neal fed 1,000 sheep during a drought by sprinkling clean wheat on the ground, a little being fed at first. The sheep were kept in good condition and reared lambs. Peas was thought the best crop for fodder in this district. The land was too hard to break up early for rape, except in the case of fallow. Mangolds paid better than sorghum and similar crops.

MALLALA, April 7th.—**Veterinary Science.**—In the afternoon the Government Veterinary Lecturer, Mr. F. E. Place, B.V.Sc., M.R.C.V.S., gave a lengthy and very instructive demonstration at Mr. Kongig's farm. Over 80 persons were present. A horse for demonstration purposes was provided by Mr. McCabe. Several horses and a cow were brought in for inspection, and their ailments explained and treated. In the evening Mr. Place delivered a lecture on "Stomach Troubles and their Remedies."

NANTAWARRA, April 8th.—DRIFT.—Members advised applying super. to the soil when barley was sown with the object of preventing drift. Mr. J. H. Nicholls preferred wheat to barley for this purpose. Mr. Smith and Mr. R. P. Uppill recommended either wheat or oats, sown with super.

STOCKPORT, March 23rd.—FODDER CROPS.—The Chairman (Mr. R. Whitelaw) thought vetches and tares would make good fodder in this district. Mr. Cant recommended sowing lucerne with the wheat. Mr. Watts thought barley was best in this district for feed, even when sown late in the year.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

MAITLAND (Average annual rainfall, 20·08in.).

April 4th.—Present: 10 members.

HANDLING WHEAT IN BULK.—Mr. F. Wundersitz read a paper, as follows:—"Whilst the bulk handling of wheat is the best system for a State which is sufficiently developed, that is, so far as railways are concerned, the wheat-producing areas of South Australia are not sufficiently connected with railways to warrant the introduction of the system at present. In the first place, most of our wheat is taken to port during about eight weeks. If we had one elevating plant alone it would mean endless complications in the few weeks during which the wheat was being handled. We would still have to provide bags for harvest. One might send in all new bags, and his neighbour secondhand bags. When the empties were returned probably the former would get the secondhand bags and the other man the new ones. About four elevators would be needed in different parts to handle our wheat successfully. More railways and new rolling-stock would be required, and in addition, each wheat-buying station would need a weighbridge. This would mean a considerable outlay." Members generally agreed that circumstances were against the success of the system in this State.

MINLATON (Average annual rainfall, 17·46in.).

March 12th.—Present: 12 members.

POULTRY-FARMING.—Mr. J. A. O'Brien read a paper in which he said—"A poultry farm in full swing should have at least 1,000 laying hens, for preference, White Leghorns, averaging from 170 to 190 eggs per head yearly. The laying flock should be obtained by culling out and breeding only from tested hens, either by trap nests or the single pen method. Careful attention to feeding and cleanliness is quite as important as 'strain,' for no matter how good a laying strain, if the birds are not properly and systematically fed, their pens and quarters not kept in a clean healthy state, payable returns will not be secured. The best wheat, pollard, bran, meat meal, maize, peas, oats only should be fed, and greenfeed and plenty of grit should always be in the pens. One of the most important items is pure, fresh drinking water in utensils which must be thoroughly cleansed every day and kept in the shade, otherwise sickness is sure to follow. The first meal should be given not later than 7 a.m., and should consist of a mash composed of two parts pollard and one of bran, lucerne chaff, and meat meal mixed with hot soup and worked with the hands into a crumbly mass (not sloppy), and served at the rate of about 4ozs. or 5ozs. per bird. Each bird should get enough to provide the machinery with sufficient to produce condition to the body, strength to the feather, and energy and power to lay eggs. The quantities required must be determined by observation, as a bird will not eat more than is necessary for its needs. The whole of the feed given to the fowls should be cleaned up by them, and none of the mash should be allowed to lie about to become soured. At noon chaffed greenfeed should be supplied, and at 5 p.m. grain, generally wheat. In cold weather peas, maize, or oats may be used with advantage at the rate of about 2ozs. per bird. The grain should be scattered in the litter to keep the birds in exercise, always keeping a good supply of grit and charcoal handy. Pens to hold about 50 hens, with warm shelter houses, scratching sheds, and dust baths are advisable. Hens provided with warm houses will give a much larger percentage of eggs than those allowed to roost in trees. An established farm should also have equipment, such as incubators, incubator houses, brooders, and chicken runs, and turn out 1,500 chickens to keep the flock up by replacing all hens over 2 years old and culls. To prove that poultry-farming in the hands of an energetic, careful man, carried out on the lines such as I have just suggested, will pay, I cannot do better than quote the figures of the last Roseworthy competition, which shows a profit of 10s. 10·2d. per hen over the cost of food. Besides marketing eggs a poultry farm must produce a good quality table bird—I would suggest the Faverolle-Indian Game cross—sending to market good 4-months-old plump cockerels and pullets from 4lbs. to 5lbs. live weight, returning an average of about 2s. per bird. It is absolutely necessary to keep two or three good cows, so that the fowls and chickens can have a supply of skim milk, the cream being sent to the nearest butter factory. Any surplus milk could be fed to pigs. The sale of cream and pigs during the year would more than compensate for the extra cost. I am not in a position to give the figures for cream, but the pig market at present is really good, and I feel sure that there would be a further margin of profit, which would, perhaps, bring the income up to about £650. From this amount the wages of a lad are to be deducted, leaving the net income, or wages, for the proprietor at about £600."

YORKETOWN (Average annual rainfall, 17·47in.).

April 11th.—Present: six members and one visitor.

Harvest Report.—Mr. J. V. Davey (Hon. Secretary) read the following report of the season's cropping:—"The season just passed has been of an unusual character, and, therefore, any reasoning from the behaviour of crops grown will necessarily be of somewhat limited application. The rainfall registered at Yorketown for the year was 4·36in. below the average, and where I reside the deficiency was even greater, especially during the earlier part of the year. Grubs destroyed a good deal of the wheat that did come up. Perhaps the most striking feature was the failure of germination in a great deal of the seed. The grain did not appear to malt very quickly. Some of my early sown wheat came up two months afterwards. Grain sown shallow fared the best; where the seed was buried to a depth of 3in. or more the plant never developed sufficient strength to force its way to the surface. It simply ran along under the crust, and after a time died off. The best germination that I had was a piece of Cape barley sown broadcast and harrowed once, the super. being drilled in beforehand. This came on comparatively well from the start, and yielded about 12½bush. As regards varieties of wheat, Federation and Marshall's No. 3 yielded about equal returns, but King's Red was not so good. Forty-six acres of Federation was cross drilled with 100lbs. super. and ½bush. of seed each way, the land being rolled between the two drillings. The crop returned about 10bush. per acre. Thirty-nine acres of similar land alongside, drilled once with 100lbs. super. and 1bush. seed (Federation) yielded 7½bush. This result of 2½bush. extra from the cross drilling can scarcely be called profitable, although it demonstrates that the land responds to some extent to the extra manuring, even in the driest seasons. I also cross drilled 34 acres of Pryor's barley with 100lbs. super. and ½bush. of seed each way, and the crop yielded 7½bush. per acre. Thirty-one acres alongside, drilled once with 100lbs. super. and 1bush. seed returned 6bush. Both of these pieces of crops were badly damaged by grubs. I am inclined to think that in such a dry season much of the super. sown remains in the soil, and my intention is, if possible, to give those two pieces of ground very light surface cultivation only and sow them with barley again this year, using about 80lbs. of super. per acre on each, and reap them separately in order to see if there is any improvement the following year from the heavier dressing of manure used in cross drilling."

MINLATON, April 9th.—Papers were read by the President (Mr. J. W. Griffiths) and Mr. H. A. Chester. Unfortunately these are not available for publication. In the course of discussion members realised that farmers had benefited greatly by agricultural research and scientific education. Farming at the present day was not dreary, but full of interest. The man on the land had to adapt himself to his environment, and the variations of conditions demanded that he should solve many problems for himself.

MOONTA, April 11th.—**Working Fallow.**—Mr. B. Ferguson had worked his fallowland immediately after harvest last year and had obtained a record return. The soil was light. Mr. J. Brinkworth favored this practice after rain, but not if the ground was dry. Mr. C. Nankivell had worked his fallow directly after harvest for two seasons, when the ground was wet, and had received very poor returns. He favored summer fallowing and working back during the following season, following which he had received an increase of fully two bags to the acre.

Double Manuring.—Mr. W. J. Brinkworth advocated this practice. He applied 50lbs. of super. when fallowing and 50lbs. when drilling in the seed. By this means the manure became thoroughly mixed with the soil. Unfortunately last year he had drilled his doubly-manured land too early, as the early rains were light and some of the wheat in the heavy land was thin. He had received best returns from the sandy soils.

WESTERN DISTRICT.

ELBOW HILL (Average annual rainfall, 11in. to 12in.).

April 4th.—Present: 10 members.

Continued Applications of Super.—Mr. H. Wheeler wished to have the opinion of members as to whether continued applications of super would have a detrimental effect on the land. The Chairman had applied super. for several years on the same land without any detrimental change being noticeable. At the same time he thought it was advisable to change the manure from phosphates to guano. Members agreed with this opinion. [If members have any doubt as to the effect of continued dressings of super. on mallee lands, they should study the reports of the Roseworthy Agricultural College Farm, where heavy dressings have been applied longer than anywhere else in the State. If further information be needed, the Principal, doubtless, would readily furnish it.—Ed.] Members generally applied the same quantity of super. for oats as for wheat.

Exhibit.—Mr. A. Chilman tabled a fine sample of lucerne of the Hunter River variety. The plot had been sown three years ago and had grown about 12in. since cut three weeks ago. It had withstood the dry weather remarkably well, and he was of the opinion that this crop could be grown extensively in the hills. The Chairman had noticed several plants growing in his paddocks. These had been sown over five years ago. Mr. F. Spence stated that some farmers sowed lucerne with wheat as food for stock. Members generally agreed that lucerne would do well in this district.

KOPPIO (Average annual rainfall, 22·40in.)

April 9th.—Present: nine members and one visitor.

Experimental Plots.—The following wheats were chosen for the variety tests to be carried out on Mr. Gardner's farm:—Early—Bunyip and Dart's; Mid-season—Federation and Cooper's; Late—W.A. Crossbred and Yandilla King. The plots were to be half an acre each in extent, fallowed and worked similarly, and all sown on the same day with 1bush. of seed and 1cwt. mineral super. per acre.

Fodder Crops and Stock.—A paper by Mr. Sprigg, read before the Morphett Vale Branch (*see* page 881, March, 1914, issue), was read by the Secretary. Members were of the opinion that the paper was an excellent one, and much of it would apply to this district. Mr. Gardner had grown kale and rape sucessfully on fallow. Barley was considered one of the best early fodder crops; sorghum had been tried last year, but with only moderate success. An excellent sample of lucerne was tabled by Mr. Gardner. It was about 18in. high, the result of three weeks growth from the last cut, and had not been irrigated. Samples of ungraded and graded wheat with the rubbish taken out by the grader were tabled by the Secretary (Mr. R. Richardson).

MILTALIE (Average annual rainfall, 14·55in.).

April 4th.—Present: 12 members and six visitors.

Farmers' Difficulties.—A lengthy paper was contributed by Mr. W. E. Hier, in which he dealt with causes which sometimes led to the failure of farmers. In the matter of share-farming, he said, many young men did not secure a properly drawn up agreement before commencing work on a block. A verbal undertaking was usually most unsatisfactory. Failure on the part of the man who had put by a certain amount of capital, and had taken up land from the Government, was due to different causes. There was too often a tendency to take little account of the possibility of adverse seasons. When these occurred immediately the farmer had taken up his land, quite likely his capital would be found insufficient. Horse stock involved a considerable outlay; clearing and fencing were expensive; and wire netting loan, land taxes, and district rates all helped to swell the expenses. As a general rule, unimproved land was not worth the value that was put on it. He suggested that land taxes should not be collected until the farm was yielding some return on the outlay. The practice of erecting sheds and providing water tanks that had been adopted by the Government was a good one, but they might go further, and roll about 200 acres of mallee, ready for the farmer to burn and clear, and thus enable him to get a crop in 12 months earlier. Such matters as want of seasonable rain, high price of labor, quick growth of shoots and scrub, high price of bags, and living expenses, and distance from markets all militated against the success of the settler. Some who had taken up land in this district had paid altogether too much for it. The construction of a railway in this district would, he thought, greatly improve the conditions under which settlers were laboring. The Chairman (Mr. P. G. Wilson) thought there should be a more equitable distribution of the good land in the district when allotted. Mr. J. P. Storey attributed the present unsatisfactory conditions in some cases to the high prices paid for land some few years ago. The Government was doing quite enough for the farmer. Mr. A. M. Wilson did not think the Government should be asked to clear the land.

MITCHELL.

March 28th.—Present: 11 members and two visitors.

Horses' Shoulders.—Mr. G. Jericho read a paper on this subject. The chief preventive measure, he said, should be to keep the animal's shoulders clean. Sweat should always be brushed off. Immediately a sore appeared the collar should be examined; a lump inside this might be the cause. If so, a bran bag should be placed under it. If no improvement were noticeable, the lining should be cut and portion of the stuffing removed. If the animals were kept in good condition, little trouble should be experienced. When they were working hard, a few pints of oats in their feed was advisable. Flies should be kept from sores by the application of blacklead finely powdered and mixed with oil, or some such preparation. Well-fitting collars were essential.

The Farm Homestead.—Mr. E. C. Jenkins read a paper, as follows:—"In selecting a site for a homestead on a scrub farm care should be taken to pick on a spot situated near the centre of the block, so that any part of the farm may be conveniently worked from the homestead. Of course, the water supply is one of the main factors to be considered, but in a country such as this, where most farmers have to rely on dams for their water, a person can usually find a suitable spot for a dam somewhere near the middle of the block. If a well of fresh water is to be found, make the homestead near this. It is better to have the farm buildings on the east side of a hill and the dam on the west. Then the drainage of the stable will be away from the dam. Build the homestead on land of a sandy nature, as it never gets boggy and muddy. Should I again start farming on a scrub block where it is doubtful whether water can be secured by sinking, I should thoroughly explore the block before putting up the house. If I could find a sandy rise with a red flat of good holding ground to the west and a good catchment for a dam situated near the centre of the block, I should place the homestead there."

PENONG (Average annual rainfall, 11·93in.)

April 11th.—Present: five members and two visitors.

Preparation for Seeding.—The member responsible for a paper was not present, and had not forwarded the paper. Regret was expressed at this, as it had a tendency to discourage members who took a keen interest in the Branch. In the expectancy of hearing a paper members did not come prepared to initiate a discussion. Mr. J. C. Steggants, who was farming in stumpy country, preferred the disc harrow to the plough for preparing his land for seeding. A cultivator only was necessary on fallow. The Hon. Secretary (Mr. J. Oats) advised early fallowing. The weeds could be killed with the cultivator, or fed down with sheep. Fallow would benefit by being harrowed occasionally. This would conserve the moisture, and perhaps tend to prevent drift, which was so likely to occur in range country. He preferred the disc plough for working stubble. The Chairman (Mr. A. Shephard) favored early sowing. The disc harrow had the disadvantage of making the land uneven.

ROBERTS AND VERRAN.

April 8th.—Present: eight members and three visitors.

Pickling Wheat.—Mr. J. C. McCallum contributed a paper on this subject. He had tried various solutions for pickling wheat, such as formalin, sulphate of copper (bluestone), with varying results. The success of bluestone depended largely upon the manner in which it was utilised. Into a 1 per cent. solution (1lb. of bluestone to 10galls. of water) in a cask, a thin bag, such as a bran bag, holding about 1½bush. should be placed and allowed to remain for three minutes. It should then be shaken vigorously and the solution allowed to drain back into the cask. If wheat were badly affected with smut a solution consisting of 1lb. of bluestone to 6galls. of water should be used. The object of pickling was to destroy the tiny spores or seeds of smut which adhered to the grain. In the discussion members generally favored sowing the seed three or four days after pickling, Mr. Masters preferred dipping the seed into the solution to the floor method. If the wheat were dipped in a solution of lime after pickling it would germinate better, although it would not run so freely through the drill. Mr. W. Kunst favored the floor method of pickling. Mr. W. Sharman also adopted this method and was seldom troubled with smut. Mr. Masters considered formalin a preventive of black rust, but thought the wheat did not germinate well if left too long before being sown. He preferred pickling all seed, but would only sow dry seed in dry weather before rain.

YABMANA (Average annual rainfall, 17·14in.).

April 4th.—Present: six members and two visitors.

Bulk Handling of Wheat.—Mr. Robertson expressed the opinion that the introduction of this system would result in a great saving of bags and do away with the practice of "docking" on inferior samples. Mr. Schumann thought wheat in bulk would not realise the same price as that bagged. Bags would not stand refilling many times, and unless sufficient to hold the season's crop were purchased, extra teams would be necessary to cart the wheat as it was harvested. Mr. A. McCallum agreed. Mr. F. A. Beinke suggested a trial shipment in bulk.

YADNARIE (Average annual rainfall, 14·09in.)

April 4th.—Present: 12 members and four visitors.

Stubble-Burning.—The following paper was read by Mr. W. L. Brown:—"On this matter there are numerous conflicting ideas. My experience is that the crops which have to follow on stubble without the advantage of burning off have in every instance been greatly inferior to that sown on the burnt land. Burning off improves the fertility of the soil by the deposit of ashes which result and also by the heating of the soil. It destroys the low forms of animal life which feed upon the nitrate producing and nitrogen transforming organisms in the soil. As a result the bacteria increase in numbers, and make more nitrogen available. There are two systems of farming. There is the one adopted by the pioneers, who have to clear the virgin land of all timber, stumps, stones, &c. Not until it is clear of all such obstacles can the farmer work his land on the most up-to-date methods. The most approved way then for the man who is fortunate enough to have his farm in such a condition that he can go in for working his land on the second system is to subdivide the farm into four parts, one devoted to fallow, one to wheat after the fallow, one to Algerian oats for grazing, and one to be left out to the natural grass. If this plan is followed all stubble is enabled to revert to the condition favorable to the increase of bacteria, which makes more nitrogen available in the soil. I am firmly of the belief that a lot of expensive machinery can be done away with when a farm is thoroughly clear. A farmer then could do the bulk of his harvesting with the binder. By using a header a large quantity of the straw could be saved to mix with the hay. The portion not fit for that purpose could be converted into stable-yard manure. A simple way to conserve farmyard manure is to make a foundation of a good bed of dry earth. Manure placed on this should be covered occasionally with a light protective layer of earth. Preserved in this way the manure has been found by analysis, after six months, to have lost but 2 per cent. of its quality, whilst a similar mass without the protective cover of earth lost 23 per cent. of its most valuable ingredient—nitrogen. The action of stubble in the soil is the same as that of new stable manure. It is of no benefit to the growing crop. My experience is that take-all has been more troublesome in a crop following on stubble, especially in a wet season. A good fire over the land does it a great deal of good, and there is less difficulty in putting in the crop."

COLTON, April 18th.—The Chairman (Mr. E. A. Whitehead) commented upon the dilatory spirit among members generally. He mentioned the work and efforts of life members of the Bureau, and expressed the sanguine hope that more interest would be taken in the Branch.

COORABIE, April 4th.—Stock Troubles.—Members continued the discussion, which had been carried on at the last two meetings, relative to stock troubles. A number of particular cases of complaints in horses were reported and referred to the Government Veterinary Lecturer for opinion and advice.

GREEN PATCH, April 6th.—Sorghum.—Samples of sorghum, amber cane, and kaffir corn were tabled by Mr. E. M. Sage. These had been grown in limestone soil to a height of about 7ft., without irrigation. Both in ironstone and limestone soils he had grown this crop for fodder for some years, sowing about 3lbs. of seed per acre in the late spring on well-worked ground.

MANGALO, April 11th.—DEMONSTRATION PLOTS.—It was decided to conduct experiments with different methods of cultivation, wheat variety tests, quantities of seed, quantities of super., and kinds of super. A committee was elected to arrange details.

MITCHELL, April 11th.—Mr. McCormack read a paper on castrating colts. Mr. Timble advised leaving the operation until the animals were three years old.

YALLUNDA, April 5th.—QUESTION BOX—*Ploughing*—Mr. G. Provis considered from 3in. to 4in. a fair depth to plough, but Mr. Forrest strongly advised setting the plough according to the nature of the soil. The depth of the soil in this hilly district varied considerably, and he did not favor turning the subsoil to the surface. Where takeall was troublesome shallow ploughing had proved to be beneficial.

STUBBLE-BURNING.—Mr. Fairbrother had found that cereals yielded well after a stubble burn, but the Chairman and Mr. W. Cabot considered it advisable to plough in the stubble if possible.

FRUITS.—Several members had found that apples grew well in this district. Mr. Fairbrother said that peaches, although they appeared to thrive well at first, seemed to give out when about eight or nine years old. Grape vines had proved well adapted for this district, both as to qualtiy of fruit and hardiness of plant.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

CLAYPAN BORE (Average annual rainfall, 16in. to 17in.)

April 8th.—Present: 10 members and two visitors.

EXPERIMENTAL PLOTS.—Mr. S. Hill undertook to conduct manurial and variety tests, and a committee consisting of the President (Mr. J. Gray), Mr. M. Robinson, and the Hon. Secretary (Mr. L. McCormack) were appointed to supervise.

HARVEST RESULTS.—Mr. J. Gray reported that he had sown oats on part fallow land and part stubble. The fallow land was ploughed for seeding in 1912, but left for fallow, ploughed in October and again in April. The stubble land, which was mostly sand, was ploughed in April, the heavier land being cultivated before seeding. It was sown during the first week in May. Part cut for hay yielded about 1¼ tons per acre. On stubble land, ploughed after March rains, cultivated with tine cultivator before drilling, 1bush. of Viking wheat and 60lbs. super. were sown. The result was 10bush. per acre. Stubble land ploughed in March after rain, cultivated before drilling, part with tine cultivator and part with light Norman disc. was sown with 1bush. Gluyas wheat and about 60lbs. super. per acre. This yielded 11bush. per acre. One hundred and eighty three acres were fallowed in August, and the greater part of the field was tine cultivated in October and ploughed again in April and May. Two sandhills included in this area were cultivated with the tine cultivator. This field was sown partly with Federation wheat and partly with Golden Drop. On the flats oats and Le Huguenot and oats mixed were sown; 1bush. wheat, 1½bush. oats, and ¾bush. each of oats and wheat mixed were the quantities of seed sown, and 60lbs. to 70lbs. super. The flats and as much of the sand as possible were cut for hay, yielding about 1 ton per acre. One sandhill was very badly affected with takeall. Portion of this which was reaped yielded from 1bush. to 2bush. wheat of poor sample. Federation was badly affected with rust, and some portions appeared to have been frosted. It yielded 9bush. of grain of rather pinched sample. One sandhill that had grown three crops of Algerian oats in succession returned about 12bush. per acre of Golden Drop wheat. A 300 acre field, containing about 100 acres heavy sandhills, was fallowed in August and September. Only a small portion of it was worked. It was heavily stocked with horses to eat off self-sown wheat, and ploughed in June and July before drilling. One part sown to Golden Drop in June produced a fine looking-crop, but it was badly damaged by high winds; it yielded 10bush. per acre. A large part was sown to Gluyas wheat in June and July. It was badly knocked down by the wind, and yielded 10bush. per acre. Another portion sown to Viking wheat was badly affected with rust. It yielded 8bush. per acre. A small part sown with Bunyip during the last week in July yielded 8bush. One and a quarter acres sown with 2bush. peas in last week in July yielded about 9bush. per acre. About half the crop was left on the field. There was a poor growth on sand, but on heavier land the growth was good." Mr. S. Hill cultivated portion of his cropping area in May, 1913. At the end of June it was ploughed shallow, and drilled with 50lbs. wheat and 80lbs. super. Germination was slow, but a good dark-green growth resulted in a return of 15bush. per acre. One hundred and fifty acres ploughed and drilled with 60lbs. wheat and 80lbs. super., harrowed after the drill, yielded slightly over 7bush. per acre. He believed, from the experience of the past that careful working of the land would ensure fair returns in this district.

COOMANDOOK (Average annual rainfall, 18·01in.).

April 4th.—Present: 13 members.

Fodder Crops.—Mr. Legallez contributed a paper on this subject, in which he stated that up to the present the object of settlers in this new district had been to grow wheat and destroy the mallee. The blocks were too large to be entirely devoted to cereal growing, and it would, he thought, be wise for farmers to experiment with fodders. Leguminous crops were best for the land, and he thought lucerne would prove the most profitable in this district. It should be sown early in autumn on good sandy loam, which had been manured, ploughed deep, and cultivated to eradicate the weeds. Hunter River seed, guaranteed free from dodder should be mixed with super. at the rate of about 8lbs. per acre and sown immediately, or the super. might impair the germination of the seed. As an experiment a plot should be irrigated with the waste water from the bore. If it were intended to provide grazing in the stubble paddocks, seeding at the rate of 3lbs. or 4lbs. per acre would be ample. It should be put in with the earliest sown wheats, which would nurse the tender plants. He thought that autumn sown lucerne would do better than that sown in spring as, if it germinated early, it would not suffer from the winter frosts and would get through the first summer more easily. Field peas were valuable for fattening sheep, and vetches also made wonderful growth and would stand grazing. In normal seasons such fodders as prairie grass, Italian rye grass, cocksfoot, &c., would grow successfully. Rape and mustard sown together made splendid growth of valuable fodder. Silver beet was worthy of a trial, although it would require cultivation, such as hoeing. In the discussion which followed, members agreed that experiments should be conducted to ascertain which fodders were the best for the district. Lucerne was the most favored plant. Rape did well. If this were sown with mustard there was no danger of stock becoming blown when put on it.

COONALPYN (Average annual rainfall, 17·49in.)

April 10th.—Present: 12 members and four visitors.

Horse-Breeding.—Mr. Wall read a paper. Draught horses, he said, could be bred more cheaply than they could be purchased. Light horses, however, which were more liable to accident from barbed wire, &c., should not be bred on the farm. Good feeding was an essential, and brood mares should be in first-class condition when mated.

Dairying.—Mr. J. Angel read a short paper. He preferred Shorthorn cows, he said, because they were good milkers and good beef animals. Lucerne and oats were very suitable for feeding to milch cows, and summer fodders such as maize or sorghum should be grown. Regular milking and enclosing the animals at night in a warm yard were advisable.

LAMEROO (Average annual rainfall, 16·55in.).

April 11th.—Present: 12 members.

Windbreaks.—Mr. C. Wray read the following paper:—"There is a want of something of the nature of windbreaks in this district. This matter was brought before the Advisory Board by Mr. Bonnin. The report of this gave me the impression that the members of the Board thought all the land here would drift. I would like to refute this impression at once. There are sand ridges which will drift if fallowed, and drift badly, but there is also a class of land which will not drift, no matter how often it is fallowed. In support of this I might instance a paddock I have fallowed this year. Apparently it is all drifting, but on examination it will be found that the harrow marks are still visible, and that a fine dust has drifted from the rises on to it, which gives it the appearance of drifting. In regard to breaks, one cannot treat all blocks alike to the best advantage. To have breaks running right through a paddock in many cases would mean that they would run through a lot of good arable ground. In other cases the ridges run right through the paddock; then it can more easily be dealt with. To leave the ridges in their natural state is to provide a great harbor for vermin. Where these ridges have been cleared, and are not producing much, they could with advantage be planted for shelter, but where there are blocks which have sand ridges and good flats alternately, it is harder to deal with them without spoiling the squareness of the paddock and creating a break in the middle of it, which would make it awkward at seeding and harvest time. Even taking these things into consideration, however, there are in many cases ridges of sand which do not pay to crop. I have rises which are only a few acres in size, and I feel certain it would pay me to grow something besides wheat on them, because of the heavy working and the small returns. It is on these small rises that the majority of us could grow something for shelter and for breaks, and also beautify the farm. But what are we to plant? I have not experimented in anything of this kind, but sugar gums grow well, look well, and make a nice shelter. The thought has occurred to me, however, that we might grow something that would be of value during dry seasons for food for stock. Sheaoaks might grow here, and sheep are very fond of these. Wild hop bush would also grow." Mr E. J. Trowbridge advised planting the wattle, but Mr. Townsend said this tree, when grown in this district, produced a low percentage of tannic acid, and did not live for any considerable time. He thought the gum more suitable. Mr. J. Kakoschka would plant gums in the corners of paddocks. Mr. A. J. H. Koch agreed, and advised planting when the crop was growing, as it would then protect the trees. Gums which he had planted six years ago had now reached a height of 25ft., and afforded splendid shelter.

POTATOES.—Mr. Leckie reported very successful results with Pinkeye potatoes.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

April 4th.—Present: 19 members and four visitors.

NOXIOUS WEEDS.—Mr. R. E. Anders read a paper, in which he dealt with weeds that were now growing in the district. He said—"The Scotch thistle, which was formerly under the Noxious Weeds Act, but taken off in 1890, is spreading very rapidly. Some claim that it is good feed for stock, but I have never seen stock eat it, except if nibbling is called eating. Some paddocks are now completely covered with it. Rolling Jack is another very fast-spreading weed, and can be found almost everywhere. Stock do not seem to care for it. The paddy melon is also spreading very fast, and although stock will eat it, it is harmful to horses, which are known to go blind if they eat it in any quantity. Farmers should be careful not to let them get a hold on their farms, or they will be difficult to eradicate. Nightshade is a new plant to the district, and landholders should destroy it at once, as it is very poisonous. I would like this Branch to take steps to get the Scotch thistle regazetted. It is very difficult to kill. If it is not dug up by the roots it will shoot again and grow a bigger bush than ever. It is also very troublesome in the crops when stripping, as it grows up higher than the wheat." It was resolved to request other Branches to discuss the advisableness of placing the Scotch thistle under the Noxious Weeds Act. Some members thought sheep would keep rolling Jack in check, as they were very fond of it when it was young. The plant would only grow where sheep were grazing.

MORGAN (Average annual rainfall, 9·29in.).

April 11th.—Present: six members and one visitor.

HORSES AND HARNESS.—Mr. O. Hausler contributed a paper on this subject. He stated that the price of horses had fallen largely lately, on account of the falling off in demand, which was very strong just when new areas were being opened up, and the fact that this demand had given the breeding industry a considerable impetus. This animal was practically indispensable on the farm, and farmers were strongly advised to keep only the best. Regularity of feeding was essential, little and often being the rule. Clean, dry stables should always be provided. Harness should be carefully protected from the weather; and for preference each set should be hung near the horse on which it was used. Collars should be stuffed once a year, and all leather should be oiled frequently.

PARILLA (Average annual rainfall, 16in. to 17in.).

April 9th.—Present: 14 members and one visitor.

FARM HORSES.—Mr. John Lee read a short paper. He preferred the medium draught for this district, as being more active and easier to keep in condition than the heavier animals. Good food should be regularly given in small quantities. Rock salt should always be kept in the mangers. The horses would do better loose in a yard than tied up. Well-fitting hames and collars, kept clean and soft, would go a long way to prevent sore shoulders. Mr. P. W. Lewis preferred the heavy draught horse, as it was stronger and more saleable for breeding purposes. Mr. M. Shannon said that in many cases sore shoulders were caused through bad blood. The horse's blood should not be too hot, and this depended largely on the feeding. After harvest, when horses were turned out on stubble, they picked up sand. Before being worked they should be stable fed for a week or two, and given plenty of bran. In the summer a roof over the horses would be sufficient, but it was necessary to have good warm stables for the winter. If they were accustomed to being in a yard together it was unnecessary to tie them up. In case of fire they would then have a chance of escaping. They should not be given water immediately after a big feed, especially of corn. Mr. G. Neindorf stated that if the bit were left in the animal's mouth when it came in from work, it would not then drink too quickly. Mr. A. J. Stevens favored tying up the horses, as the stronger robbed the weaker of their feed. Bran was a good remedy for sand. To prevent sore shoulders well-fittting collars were necessary, and it was better to have them too tight than too loose. Two packets of Epsom salts per week in the feed would keep the blood cool if the animals were being fed on oats or heavy feed. Mr. J. Roachock contended that horses should have freedom at night, and that a water trough should be kept in the yard. To prevent sores the shoulders should be washed with cold water immediately the collar was taken off. A tablespoonful each or carbonate of soda and ground ginger mixed with a pint of new milk made a very effective drench for sand. Mr. C. E. Moyle tied the animals up when feeding, but left them loose at night. It was a good plan to have the stable stalled off, as this prevented fighting and made it unnecessary to tie them up at night. If horses were tied up they should be bedded down with straw. A tight collar was liable to give the horse a sore neck, which was possibly worse than sore shoulders. Light horses should not be given a drink for an hour or two before starting on a journey. They could be given a good drink on their return. Horses on stubble should be given one feed daily. They would not then be so likely to pick up sand. The shoulders should be carefully washed each morning, and also, if possible, at dinner time. Mr. R. M. Shannon preferred warm water for washing the shoulders. Mr. G. Neindorf always soaked a new collar in water. It would then adapt itself to the shape of the horse's shoulder. Applications of vinegar were good for the shoulders of young horses. Mr. Gregory contended that horses would do better if they were fed in small quantities at frequent intervals. When turned out on stubble they should be given a couple of sheaves of hay per day. This would prevent sand and they would be ready for work when required. They should not be worked too hard after coming in from the paddocks. Mr. E. J. Kerby advocated the use of vaseline, if sores appeared on the shoulders. Mr. C. Foale favored re-padding collars each season.

Manure for Mallee Land.—Mr. M. Rush read a paper, in which he recommended the following treatment for new mallee land:—Fifty pounds super. should be harrowed in after the drill; the land should be ploughed the second year, and 70lbs. of manure applied. After drilling sand rises, he had applied a further 30lbs. of super. per acre when the wheat was well up, and the returns were better than those secured from the flats. Fallow should be well worked and sown with 100lbs. super. and 60lbs. wheat; good working was essential to get the best results from the super. He would not put more than 100lbs. of super. per acre on red flats, as the crops thereon had a tendency to blight after frosts and hot winds; 120lbs. per acre could be applied to sandhills. Mr. Shannon thought it a good idea to apply more super. to the sandhills than to the flats. Too much super. on the flats was liable to cause the wheat plants to blight off. In dry weather 70lbs. of super. on the flats and 100lbs. on the sandhills was sufficient. Mr. Roachock believed in harrowing after seeding. Mr. C. Foale had applied 65lbs. of super. on a plot of fallow land, and alongside had applied 130lbs. The heavily manured plot yielded 2bush. more per acre, was not so badly affected by the hot winds. The amount of feed which came up subsequently was quite double that on the lightly manured plot. Mr. E. J. Kerby thought 80lbs. per acre the best quantity of super. to apply. Guano super. was good on sandy land. Mr. H. G. Johnston had obtained his best crop from land on which he had applied 40lbs. of second grade super.; 40lbs. more could be safely applied to flats than to sandhills. Mr. J. Lee thought it a good idea to roll the land shortly after the wheat came up. This set the sand tight and conserved the moisture.

WILKAWATT (Average annual rainfall, 16in. to 17in.)

April 4th.—Present: 15 members and three visitors.

Preparation for Seeding.—Mr. D. F. Bowman read a short paper. He mentioned that excellent weather for stubble-burning had prevailed, and thus the growth of the mallee shoots should have been effectively checked. The only way of killing the shoots, he thought, was to plough out the stumps. It was too early to sow just at present, unless the land was particularly clean. The practice he recommended was to work the land with the idea of encouraging the weeds to grow, then destroy these with the cultivators, and follow closely with the drill. Members thought the fire-rake went a long way towards ridding the land of the green growth of mallee.

BORRIKA, April 11th.—Present: 26 members and five visitors. Members discussed various matters dealing with seeding operations, such as ploughing, pickling, &c. Mr. Sandercock, of the Northfield Branch, addressed the meeting, urging members to foster the Branch in every way as a most valuable institution.

SUTHERLANDS, April 4th.—Arrangements were made for Mr. A. M. Twartz to conduct experimental plots on behalf of the Branch.

SOUTH AND HILLS DISTRICT.

CHERRY GARDENS (Average annual rainfall, 35·03in.)

April 7th.—Present: 12 members and several visitors.

The Agricultural Bureau.—Mr. C. Beaumont delivered an address. Te be successful, he said, Branches must have live and energetic members. A large membership did not always denote this. The men who were most willing to help their fellow members were those who took most pains to better their own conditions. It was not expected that all could contribute papers with equal success, but they could lend their assistance in other directions. Members should take note of any new subjects which were likely to be of interest to others; helpful discussions were in this way initiated. Mr. Beaumont was asked and answered a number of questions dealing with fruit pests, etc.

CLARENDON (Average annual rainfall, 32·67in.)

March 16th.—Present: 10 members and one visitor.

Selection of Seed.—Mr. J. Spencer read a paper. Last year, he said, he purchased wheat for seed from another district. The variety was supposed to be White Tuscan, but it contained from 20 per cent. to 25 per cent. of another wheat, which was inferior. This only grew to a height of 3ft. 8in. when the White Tuscan was 5ft. 2in. high. He considered this depreciated his crop to the extent of from 6cwts. to 8cwts. per acre. For several years he had been trying field peas from different districts with various fertilisers at the rate of from 1cwt. to 4cwts. per acre. The seed sown each year was carefully selected, but a change of seed seemed to be the best method of securing a heavy yield. This year peas from seed grown near the sea yielded 29bush. per acre, an adjoining block sown later averaged 18½bush., but locally grown seed did very poorly. Seed potatoes were secured from Victoria last year, and some of these appeared to have been dug before they were matured. These yielded a much inferior crop to the thoroughly matured tubers. His conclusion was that it was necessary to exercise the greatest care in the selection of seed. Samples of hay and potatoes were tabled. Members generally favored the practice of pickling seed wheat.

FOREST RANGE (Average annual rainfall, 35in. to 36in.)

April 9th.—Present: eight members and two visitors.

Orchard Cultivation.—Mr. J. Green read a paper. In the early stages of the growth of an orchard, he said, it usually received fair treatment. The soil was well broken, the trees were well pruned, manures applied, and such crops as peas and swedes grown between the trees. When the practice of growing these crops was discontinued sorrel immediately took possession of the land, to the detriment of the trees. This could be best destroyed by running a cultivator through the orchard. The land should also be cultivated once or twice during the summer to keep the soil loose and conserve moisture. Mr. F. Green agreed with the idea of growing peas between the trees. If the cultivator were used frequently the land would become lumpy. If the orchard were ploughed in spring and harrowed the same day, the soil would remain loose throughout the summer. Mr. Schultze did not approve of autumn cultivation. He preferred to allow the grass to grow during winter, plough it in September, and harrow three weeks later, both ways. Mr. E. Rowley would grow white peas and manure them well. In autumn it was possible to plough more deeply than in spring, as deep ploughing would then injure the roots. The harrows should follow immediately after ploughing, and again after rain. Mr. A. Green favored ploughing under crops of sweet peas. Mr. McLaren preferred deep ploughing, and recommended growing potatoes between the trees and ploughing in the tops. Mr. F. Rowley had autumn ploughed some very wet ground, turning the furrow towards the trees, and leaving a furrow in the centre between the trees to drain off surplus water. In reply, Mr. J. Green said he ploughed in the late spring and cultivated as late as January. He would plough wet ground early in the winter, leaving a furrow down the centre to allow the water to drain off.

HARTLEY (Average annual rainfall, 15in. to 16in.).

April 8th.—Present: 16 members and one visitor.

Farm Lads.—Under this heading a paper was read by Mr. S. Beavis, dealing with the question of farm labor generally. The best workmen of all, he said, were the farmers' own sons, who had an interest in the farm, had been accustomed to stock, implements, and general affairs all their lives, and looked forward to taking over their father's properties, or other farms later on. The occupation of farming as a pursuit for educated men was now more generally recognised, and having the opportunity of gaining some technical knowledge at agricultural schools and colleges, the present day farmers' sons were the

right men to keep on the land. Hired lads, as a rule, he thought were not so satisfactory, although some of them were good lads, honest and enthusiastic. The immigration of English lads for farm work did not commend itself to him. Practical farmers, with sufficient capital to take up land, were more to be desired. For those farmers whose holdings were sufficiently large to warrant it, the solution of the labor problem was to employ a married man who could live on the farm. A good man on a good farm could always command good wages.

IRONBANK (Average annual rainfall, 33in. to 34in.)

April 11th.—Present: seven members and two visitors.

Poultry Raising.—Mr. R. Coats read a paper on this subject. The site for a poultry farm, he said, should be selected on a sunny slope, preferably one with a covering of scrub and timber. This provided shelter, and also food in the form of insects which abounded in the decaying leaves. The yards should be netting fenced to a height of 6ft. or 8ft. The bottom wire, of which there should be four, should be barbed, and be at least 4in. under the ground. The netting should be fastened to this. The top wire should support the top of the netting, the next should be half-way down the post, and the third half-way between this and the bottom. Roomy houses of galvanized iron, and facing north, should be provided. If it were found necessary to use wood in their erection, all joints and cracks should be tarred. The perches should be about 3ft. from the ground, and movable. Once a week the woodwork should be sprayed with kerosine, and the ground sprinkled with lime. Ducks should on no account be allowed to run with hens. Drinking vessels should be scalded at least twice a week, fresh water being supplied daily. The paper continued:—"Add a pinch of Epsom salts to the drinking water at intervals in the hot weather to keep the birds in a healthy condition. If the yolks of the eggs are rather pale, drop a few rusty nails into the water. Keep the water in a cool place. The morning meal should consist of a mash—pollard mixed with the kitchen scraps or a little bran. Make it into a fairly stiff paste. In the cold weather add a little pepper and meat meal, or boil some meat and mix the soup into the mash. Always keep a supply of shell grit, so that the fowls may get at it as they require it. At mid-day a supply of green feed such as chaffed lucerne, lettuce, cabbage, or any such green feed should be given. The evening meal should consist of grain. Maize and peas are best for cold weather, but they are too heating for summer feeding. For breeding stock pick out the strongest and best birds from the flock and feed them well. The male birds should not be related to the hens. Hatch the chicks early, and so dispose of the roosters early; the pullets will lay when eggs are scarce. Ducks and turkeys are also best hatched early. If a duck is fed well from the beginning, at 10 weeks old it should be ready for market, but a chick should be ready at from four to six months old for market purposes. Cox's chickvital gives the chicks a good start, and they will make rapid growth on it. Give them this till they are about three weeks old, when they should be changed to the ration previously recommended. Geese involve very little trouble. When hatched they feed on grass, and no work is needed with them until they are fit for market. Turkeys are more delicate, they require more attention, and a good supply of green feed. When turkey chicks are hatched they require a warm coop. Feed them with one part of hard-boiled egg, two parts of dry oatmeal, two parts of parsley, cress, or lettuce, chopped very finely, three times a day. When setting hens seek a sheltered corner; there dig out a hole in the ground big enough to make a nice nest, sprinkle a little new lime in the hole, then put in some clean straw, sprinkle a little more lime to make sure that vermin will not trouble the hen. After a fortnight renew the nest and add more lime. Do not have the setting pens too small, for the hens need exercise. Also have a good dust bath. Feed her on wheat, and see that fresh water is always available." Members thought it preferable to use 1in. mesh netting for the lower and 2in. mesh for the higher half of the yard fences; thus obviating damage to the combs of the birds.

INMAN VALLEY (Average annual rainfall, 26in. to 27in.)

February 2nd.—Present: 16 members.

Exhibits.—Mr. H. J. Jagger tabled some fine Brown Spanish onions, the average yield of same being about 20 tons to the acre. Mr. V. G. Tugwell tabled some large potatoes of the Carmen variety. One tuber weighed 2¼lbs. The Hon. Secretary (Mr. H. M. Parsons) tabled some Indian corn (gram). The Hon. Secretary thought this a much hardier plant than the field pea. It had withstood the severe frosts of last winter, and had been eaten off three times before October. It did not blossom until November, and would perhaps suit the Northern districts.

Irrigation.—Mr. G. McCoy read a paper. He said:—"Differences in soil, climate, and natural features of the country will not admit one system of irrigation being definitely laid down. Few of the great irrigation schemes that exist in all parts of the world, and especially in Australia, can be said to have passed completely beyond the experimental stage. We hear of wonderful crops of fruit, vegetables, fodder, &c., as the result of irrigation, but the financial part of the process is not carefully gone into by disinterested people, and the producer himself too often is willingly blind to the cost of production so long as he has the pleasure of gazing on green fields and beautiful orchards. As an indication of how much we are in the dark yet, I might state that there are scarcely any published works on irrigation. I do not wish for one moment to suggest that irrigation is a failure, or a financial trap to catch the unwary. Far from it. Under easy conditions there are few things more profitable and certain to bring in a handsome return for one's outlay and labor. The first irrigation scheme with which I had anything to do started in 1887. It was the first in this colony—Renmark. I made the survey, and consequently have taken notes now and then of the progress made. Owing to want of capital by the originators of the scheme the early settlers were confronted with apparently insurmountable difficulties, but the Government came to the rescue, and now most of the growers are in comfortable circumstances. In the first few years some of the growers thought they had planted the wrong sort of fruit. At that time there was not much demand for lemons, so some lemon growers rooted up their trees. The very next season there was a scarcity of this fruit, and the price rose to 3d. each. There were several instances of that kind even with other fruits. It is a great mistake to think that because a certain product is not saleable one year that it will never pay to grow it. The fluctuations in the demand for all produce are simply due to a glut in the market. *Orchard.*—When selecting a piece of ground for orchard irrigation take care that there is only one slope, and that a gentle one. On no account choose undulating country. It is very expensive to work, so much channelling to make and a lot of extra running about when watering, and the planting has to be arranged in order not to interfere with the channels. The usual plan on the River Murray is to make a main channel of concrete along the highest boundary of the block, with a fall of 2ft. to the mile. Sub-channels can be made from the main channel, with an outlet for each row of trees. A deep plough furrow is then run along both sides of each row of trees, and the water directed into these furrows. When the water has sunk into the ground the furrows are filled in again. This prevents evaporation, and the trees get the benefit of all the moisture. This is done from three to five times a year according to the season, and considerable judgment is required as to when to apply the water. Sometimes a heat wave comes along and lasts perhaps a fortnight. The growers all call for water at exactly the same time, and sometimes the last man to get served has the misfortune to see a lot of his fruit falling off the trees. Fortunately this does not occur very often, and they now generally are able to cope with emergencies of this kind. *Lucerne.*—As with orchard land, a block for lucerne-growing should never be on undulating ground. If a slope is unavoidable see that it is a very gentle one. The ground should be kept absolutely clear of all growth of every kind right through the autumn and winter. Lucerne does not like bad neighbours when first planted. It wants the ground to itself, though when thoroughly established it will flourish in spite of much bad treatment. It should be ploughed with the slope, not across it, and drilled in the same direction. The reason for this is to give the water an even flow. If the ploughing is across the slope the water lingers at every ridge, and consequently takes a long time to get down to the end of the patch and the top side is getting more than its proper allowance. As before stated the slope must be very gentle or the water will rush down to the end of the paddock and form a large pool. Never make an earth channel with a fall of more than 4ft. to the mile or a washout is likely to occur. If a slope is more than that the difficulty can be got over by making steps. That is the system adopted in the drainage works of the South-East. Always sow lucerne thick. Do not imagine that because it comes up thin owing to want of the proper quantity of seed the gaps can be filled up later on. It must all come up the first season. There is no better illustration than with lucerne of 'the survival of the fittest.' Old plants will not let young ones grow alongside of them, even if planted by hand. When once established it submits to a lot of hard treatment, but overstocking will, of course, kill it. Brackish water is not detrimental to lucerne. It likes a certain amount of salt, though of course very brackish water will kill it in time. On LeFevre's Peninsula, near Port Adelaide, a resident had a small patch of lucerne growing on a low-lying piece of sandy ground. It was doing well, when an abnormal flood tide flooded a great part of the Peninsula. Part of this patch of lucerne was under water for two or three days. In a few weeks the patch was as luxuriant as ever, and the portion that had been under water longest was the most luxuriant and a beautiful dark green. In one part of Holland they grow fodder that will stand periodical waterings with salt water, and in the Isle of Jersey seaweed is applied to the soil in immense quantities. The channelling for a lucerne block is the same as for an orchard, but care must be taken to see that there are no dry patches left. When the ground is level the most favored proceeding is to flood it, using light 4in. to 6in. galvanized piping connected with canvas joints. These can be disconnected and moved about easily, and a big flow of water kept going. *Rape, Maize, and Vegetables.*—Rape and such like can be treated in much the same way. Maize is generally planted in rows that can be cultivated. Sprinkling appears to be the most natural way of irrigating, but it is very expensive, and also very slow. The sprinklers need constant attention, lifting them about and keeping them level. They are best suited for lawns and small gardens. Nothing is easier to irrigate than vegetables. If rows are convenient distances apart it is simply a matter of directing the water. Care must be taken not to overdo watering. Provided that one escapes frosts and such pests as snails, vegetable growing pays handsomely. But of course there is more work attached to this branch of irrigation than with fruit, lucerne, &c. Mangolds and such like can be treated as vegetables. Field turnips and silver beet grow best in winter and spring, consequently they do not need irrigation, and the best way is to sow them broadcast. I would never advocate raising water more than 40ft. above the supply, that is to say, above the spring, well, or river from which the supply is obtained. I know of some large schemes where the water is raised 150ft. or more, but this requires enormous engine power. The best system in this State so far is on the Murray in the neighbourhood of the Bridge, where the swamps have been reclaimed. They are level, no pumping is necessary, and all one has to do is to let the water in as it is required. However, nearly all these swamps need sweetening. There is a sourness in some and a salty nature in others that must be eradicated before a compensating return can be expected for the labor and outlay. In some places, where there is every appearance of promising soil, seeds actually refuse to germinate. I know of a reclaimed swamp higher up the river that has been cultivated once or twice, and grows magnificent oats over 7ft. high, but there is something in the soil that gives the hay a poisonous nature. No doubt with continuous cultivation this bad quality will disappear. For centuries these swamps have been feeding ground for immense flocks of wildfowl, and it is quite possible for the mud to have become impregnated with too much poisonous matter, which though not prejudicial to the growth of vegetation may affect its quality. *Local Irrigation.*—There are flats in this district that cannot be beaten for irrigation. The purest water can be got at shallow depths in unlimited quantities. The lift would not be much more. The soil is as suitable as any in the State. What it lacks in salt, lime, &c., can be cheaply applied. Even without these it is rich enough for most things. I would advise anyone who has 10 acres of such country to get an engine of say six to 10 horse power and a suitable pump and intensely cultivate that area. I am confident that the result as a paying venture would be surprising. The engine is purely a matter of choice. I prefer steam, because in this district wood costs nothing. If anyone takes the trouble to work it out he will see that after all there is not very much to choose between all the engines, and it is significant that steam, petrol, and oil engines are still being manufactured in the same proportion as usual. If there were any great difference in the cost and working expenses the engine wanting in these advantages would speedily disappear. One advantage I can see in the quick-running engine is that there is no loss of time getting up steam, but as for the statement that they require no further attention, that is ridiculous, and when anything goes wrong an expert is generally required to put it right. We learn lately that large ocean vessels have adopted the crude oil engine, but one reason is the fuel is much cheaper than coal, can be handled easier, and packed in a smaller space. There is no engine easier to understand than steam, and one can regulate the power and speed, which one cannot do with most petrol and oil engines without adding very materially to the cost of working and wear and tear. I do not like windmills for irrigation. It is a powerful mill that will keep one acre irrigated, and when the wind fails in hot weather it is not a success. They are all right for a house supply and flower garden or watering stock, if one has a storage tank, but as 1in. of water over an acre of ground means about 23,000galls. the cost of tanks to hold this for irrigation would buy an engine that would pump the quantity in a few hours. *Returns.*—The question might be asked—What is a fair return to expect from irrigation? A well-tended orchard of mixed trees in full bearing under favorable conditions might be expected to yield a net profit of £100 per acre. I have heard of some extraordinary returns much higher than that, but am speaking from notes taken personally. This is assuming that a market is easily accessible. With lucerne one could expect 4 tons to the acre, cut five times a year, and grazing for fattening stock. Vegetables pay better than anything if the conditions are all right, but the work is correspondingly much greater. The produce is perishable, and a market must be handy. In these estimates I have taken care to keep well within the mark. Doubtless there are some present who can tell of larger returns; for instance, one grower on the Murray told me he cut his lucerne 12 times in one year. To that I would say he cut it too often, and was doing the very thing to kill it. No plant will stand that sort of thing for many years. There seems to be no soil more suitable for irrigation than a deep red sandy soil over red clay. For oranges especially this soil is ideal. It will stand continuous working, never sets hard, and retains the moisture. Fertilisers are easily applied, and the fruit has a glorious deep red color. In this soil oranges will produce a crop in four years. All sorts of fruit flourish in ground of this nature on the Murray settlements. It seems to contain all the necessary ingredients for producing fruit of the first quality. One of the most successful orange growers at Waikerie never allowed the surface roots of his trees to come within 8in. of the surface. These are the fruit supplying roots, but he kept them down by ploughing deep, and he was justified in doing this by the result, for better oranges have not been grown in Australia. The branches shaded the butt of the trees, as they were allowed to hang to the ground. Of course all superfluous inner growth was pruned out to let in the air and a certain amount of sunshine. By keeping the surface roots down he did not allow them to get scorched. Thorough cultivation seems to be responsible for most success on an irrigated block. Although oranges will grow in this district they do not come to the same perfection as on the River and at Salisbury, north of Adelaide. But other fruits, such as apples, pears, plums, peaches, apricots, and nectarines cannot be beaten if they receive proper attention. They do not need irrigation in an ordinary season. It is astonishing how even poor soil can be made productive under irrigation by continuous working, sweetening, and the judicious use of fertilisers. With soil of a stiff clayey nature, such as we have here in places, it is an excellent thing to cover it with sand, even to the depth of 1ft., and plough it in. Sea sand will do as well as any if close at hand. It keeps the ground open and porous."

INMAN VALLEY (Average annual rainfall, 26in. to 27in.)

March 18th.—Present: 10 members.

POULTRY.—Mr. H. G. Allert read the following paper:—"The first consideration is the yards, the smallest of which should not be less than 10ft. wide by 40ft. long, and divided into two. The fowls can occupy one yard for 12 months whilst the other is dug over and sown with gross-feeding plants, such as kale, cabbage, rape &c., which causes the ground to become sweet and clean. Shade and shelter can be easily supplied by a framework of wood covered by galvanized iron, the latter being covered by a coat or two of King's Compo. in the summer. Poultry houses should be built of the best material possible. The timber should be hard wood, not given to crack in drying, such as jarrah or red gum, preferably the former. The roof, sides, and ends should be of galvanized iron, the front should be netted, the weather end of the front being partly closed in with, say, two sheets of iron. About 3in. of the back, just under the roof, should be open for ventilation. The weather end of the house must contain the roost and perches, because if built as here recommended there will be no draughts. The other end will constitute the scratching part of the house. It is here the fowls are fed when the weather is wet. The scratching and roosting parts are separated by a jarrah board 12in. high and 1in. thick. The same kind of board runs around the bottom of the whole house; a door must also be provided. A house 10ft. long, 4ft. 6in. wide, 5ft. high at the back and 6ft. in front, will accommodate from 20 to 25 hens. One 16ft. long, 6ft. 6in. wide, 5ft. at back and 6ft. in front, will be large enough for 40 to 50 hens. The perches should not be higher than 18in., so that the birds may not injure their feet or legs in their descent. I prefer them to be about a foot off the ground. They should be 2in. by 2in. jarrah, square, with the edges slightly rounded. They may be hung or fixed, but in any case should be movable in order that they may be cleaned. At least once a fortnight the roosts should be well scalded and cleaned with boiling soapwater, and when dry painted over with kerosene. The scratching shed floor should be well covered with straw, wheaten chaff, or other clean litter, and the grain food buried therein. This will keep them warm, as well as give them healthful exercise. Nests should be on the ground, and so made that they should face the wall, as a laying hen likes privacy. Water should be given several times a day. Let it be clean and cool. See that the dishes are cleaned every day, and once a week at least with a good disinfectant, after having boiled them in water and soap. The washing copper may be utilised for this purpose after the weekly washing is done. Tin or iron utensils must not be used, good earthenware is the best. Shun patent fountains, as well as those of home manufacture, because they are harbors of disease. Douglas mixture and other chemicals which must occasionally be utilised, cannot be used in them. Place the drinking water high enough to prevent the fowls scratching filth into it. Good sharp grit should be supplied every day, also shell grit, old mortar, and charcoal. The latter I consider of the utmost importance, as I have found that, given plenty of charcoal, poultry can easily be kept in good health. Cleanliness must be strictly observed. Droppings of poultry make a valuable manure and should be removed often; daily if possible. In fixed houses, with just the the natural floor in them, remove a little of the surface every time the house is cleaned, and replenish with fresh dry earth sprinkled with slaked lime and wood ashes. *Feeding.*—When feeding for egg-production give the best grain procurable. Wheat, oats, maize, and peas can be used, mixed or separately. I mix wheats and oats in the proportion of three parts of wheat to one of oats, and have found this very suitable. About twice a week I mix very coarsely-crushed maize and peas with the wheat and oats. This gives a good change and supplies them with an extra amount of protein necessary for egg-production. I give the same amount of food always after first having found out the amount necessary to every individual fowl. By handling individual fowls daily one can soon find out whether they are over or underfed. Maize and peas fed daily are too fattening and cause the fowls to cease laying. In table fowls maize produces a very coarse, unpalatable yellow fat, and it must be judiciously fed; but it is necessary on account of the oil it contains. My experience teaches me that it should be given in small quantites in summer, whereas in winter a little more may be used. Peas on the contrary contain a high percentage of protein, but are deficient in fats and oils. When mixing maize and peas with the daily ration of wheat and oats I used one part of maize to two parts of peas. Feed grain to fowls twice a day, morning and evening. Two mornings in the week I give them soft food, consisting of one part of bran and two parts of pollard. With the soft food I also mix a little linseed, bonemeal, salt, and meatmeal, with just enough boiling water to mix the bran and pollard to a crumbly consistency. I also add about one-third of the whole bulk of chaffed greenstuff and sufficient charcoal dust to slightly color the whole. All this, well mixed together, is given in feeding pans, which must be kept scrupulously clean. With the soft food I also mix any medicines or tonics which must be occasionally given, such as sulphur, Epsom salts, ground ginger, &c., as this food forms a convenient vehicle for administering these. Ginger should be given in winter, when the weather is cold and frosty. The feed of stock birds should be simple, but nourishing, so that the supply of eggs is moderate. Grain should be the principal food, with soft food occasionally. Torrified grain is very good at this time. Coarse bonemeal, shell-making material, and plenty of green food are necessary. A fortnight before incubating mate the hens with the male birds, which should at other times be kept alone. This will keep them healthier and stronger, and the eggs for incubation will yield sound and healthy chickens. Eggs for market should never come from mated fowls. Do not give rainwater, as this does not contain the necessary salts. If a fowl is not looking perfectly healthy take it away from its mates, keep it by itself, and attend to it separately at some distance from the others. It does not pay to doctor poultry as a rule. Generally it is advisable to destroy and bury deeply the sick fowls."

KANMANTOO (Average annual rainfall, 17·90in.).

April 4th.—Present: 14 members and one visitor.

Treatment of Ewes.—Mr. A. Mills read a paper on this subject. Ewes should not be too fat when the rams were put with them, he said. One ram should be given between 50 and 60 ewes for about six weeks, after which a "picker up" could be put in the flock to impregnate the "stragglers." Careful note should be kept of the time that the rams were put in, so that the flock owner should know when to expect the lambs. The ewes, when carrying the lambs, should have an abundance of good drinking water, and their eyes should be kept free from wool. Three weeks before lambing commenced they should be mustered, left in a yard overnight, and then crutched. The left arm of the operator should be placed well down on the animal's neck and around the brisket. The off hind leg should be seized with the right hand, and drawn forward. The sheep should be gently lifted, and deposited on its rump, backed up with the operator's legs, and have its head doubled to the left. The eyes should be well cleaned, and then a commencement made at the lower edge of the belly, cutting away the grease tags to allow the lamb to locate the teats. The cut should follow down to the tail, leaving a clean track, so that the afterbirth and urine did not collect and encourage the attention of flies. Care should be taken not to cut off the tip of the vagina. During lambing the sheep should not be moved to strange paddocks, or there would be a danger of the young mothers leaving the lambs, and wandering about. Careful watch should be kept, and in the case of false presentation assistance should be given; otherwise the ewes should not be disturbed. When assistance was necessary, violence should not be used, but the animal would bear a good deal of force. If it were necessary to cut away the lamb, a blunt-pointed knife should be used.

If the womb still protruded it should be washed with warm water and carefully placed in position. A couple of stitches should then be put in the lips of the vagina. Trouble of this nature would almost assuredly recur at future lambings, so the animal should not again be used for breeding. When sore teats occurred powdered borax and honey should be well rubbed into the affected parts; a solution of alum should be applied in cases of inflammation of the udder. Lambs could be tailed at a week old; a clean, sharp knife being used in preference to the searing iron. Castration should take place a little later. The ewes should not be changed to very rich feed, or mortality would occur amongst the lambs. Epsom salts, or a similar purgative might well be used in this and similar cases. The flock owner was well advised to spend a few pounds for feed for ewes during dry seasons.

LONGWOOD (Average annual rainfall, 37in. to 38in.)

April 11th.—Present: six members and three visitors.

Homestead Meeting.—The meeting was held at the homestead of Mr. J. C. Blakeley. An irrigation scheme from a spring in a hillside was much admired. In the orchard the trees looked healthy, and although only in their third year were carrying apples. These trees were not planted in holes. Some members thought that unless the ground adjacent to the trees was kept well stirred the trees would fail in a few years time. The usual method of planting trees in this district was to dig holes 4ft. square down to the clay, and loosen the subsoil well with a bar.

MEADOWS (Average annual rainfall, 35·52in.).

April 7th.—Present: 11 members.

Bee-Farming.—Mr. H. Thorn read a paper, as follows:—"The climate here is not suitable to make bee-keeping a really profitable industry. The winters are too cold, long, and we have too much rain during the swarming season. Most of the bees in this district are hybrids. The first cross between the Italian and the common black bee is in many cases equally as profitable as the pure Italian. I tried the Cyprians here about five years ago, but they proved a failure. They were very hard to shake off the combs and very vicious. The black bees are not so particular as the Italians in defending their hives against the wax moths. They also swarm too much; I have known a hive to send out four swarms in about six or seven weeks. Queens should be reared in the strongest colonies, so that they get every possible attention from the workers. It is of great importance that the young queens are well fed in all stages. The bees should be gathering honey while queen-rearing is going on. Queens are at their best in the second year. They are often kept far too long; three years is quite long enough. A good many are then past their profitable age. This is the reason we have so many small useless colonies in our apiaries. I use the double Langstroth hives in my apiary, but do not have the excluder between the boxes. One great drawback is that it closes half the ventilation space between the boxes, with the result that a large force of bees is employed fanning at the entrance to keep the hive cool. When the hives are badly ventilated the bees show a great desire to swarm. The excluder is very useful in transferring bees from common boxes into hives, however. Turn the box upside down and place the hive on top of it, drive the bees up into the hive. Then place the excluder between the boxes. The bees will hatch out the young brood in the lower box, and the queen will start to lay in the top hive. In 21 days the brood will all be hatched out of the lower box. This should then be removed. This plan will give good results if carried out when there is a flow of honey coming in. Foul brood is a germ disease of a very infectious nature. The treatment is to drive the bees out into an empty box and keep them enclosed until the next day, then hive them on starters of foundation. The hives and frames should be boiled. With paralysis, which I found in my apiary some eight years ago, the bees crawl out to the entrance of the hive, seeming to have lost nearly all power of their legs and wings. The treatment I adopted was to destroy the queen and put a younger one in her place. The hive recovered."

MOUNT BARKER (Average annual rainfall, 30·93in.).

April 8th.—Present: 53 members and three visitors.

Sheep or Cows on a Small Farm.—Mr. A. B. Blades read a paper. He said—"A man will have the most success in dealing with cattle or sheep as they appeal to him most. We all have our likes and dislikes, and he who naturally likes cattle will do better with them than the man who naturally likes sheep. Now, to treat the subject in a more concrete form, I will take as a basis of our discussion a farm of 200 acres in this district, comprising for the most part good land with a small portion of roughish gravelly soil which, however, will grow a little grass, and which, if fenced off, will prove a most useful change paddock for sheep. We crop 100 acres of our farm annually, leaving the other 100 under grass. In putting the utility aspect of sheepfarming I would draw your attention to the fact that the United Kingdom maintains an average yearly total of about 25,000,000 sheep. Throughout the whole country these animals are regarded as the most important of livestock, because they fulfil the onerous task of paying the rent. This part of the question, of course, is not so vital to us, as our lands are not of such high values as in the old country. Nevertheless, it must be admitted that an animal upon which devolves the task of paying the whole cost of the use or interest on the value of the land, and succeeds in doing it, must be of a very high utility value. Now comes the question, which breed of sheep is of the highest utility value to us in this district ? Without any hesitation I give the place of honor to Comeback ewes. These are among the very best as mutton sheep and wool producers. Mated with a good Shropshire ram the progeny will be the very *beau ideal* of a lamb. Sheep, under good management, can be depended upon for three sources of income, viz., the fleece, the lamb, and the carcass. *Management.*—Under the heading of management comes the question of feeding, and this taps a source of immense possibilities. Now, I doubt very much if there is another country in the world where the natural grasses will keep and fatten stock as in Australia, consequently the practice of hand-feeding has not received the attention here that it has in the colder climates. For about six months the English farmer has to handfeed his sheep, and the system of artificial feeding has been brought almost to perfection. In the art of feeding animals we cannot 'hold a candle' to the English farmer. I have seen, in the middle of winter, on farms where the sheep have not had a bite of natural grass for months, Oxford Down sheep rolling fat, which made between £3 10s. and £4 per head. What is the secret of this ? In a word—good management. This question has, as I say, received scant attention in Australia ; but the growing of feed for sheep is bound to come, and under the able advocacy of Mr. Henshaw Jackson, the wool expert, who has been doing experimental work for years, sheep men are slowly but surely realising that there is something in it. I am convinced that when the practice and art of artificial feeding are understood it will mean thousands of pounds into our pockets. The Advisory Board is anxious for Branches to undertake experimental work. Here is some work that can be undertaken by this Branch. In stating the case for sheep, I do so on the assumption that the animals are given reasonable care and attention, and also that in the winter, when there is little natural feed about, artificial feeding is resorted to. I can hear the dairymen saying, 'No ; you cannot put your feed into a better animal than a cow.' Well, they are entitled to their opinion ; but I would point out that 25 sheep do not rob the soil of as much fertility as the cow fed for milk production, and, unlike the cow, return what they borrow, so to speak, in the shape of readily available manure evenly and widely distributed over the land. When this point is carefully considered it opens up vast possibilities that may mean the salvation of a lot of farmers whose paddocks are dirty and sick. With regard, again, to the actual feeding of the animals, Sir J. B. Lawes, the leading agricultural experimentalist of the world, has conclusively demonstrated that sheep may be fed with a profit of 50 per cent. more than cattle. In the dairying industry the silo has proved its worth as a factor in maintaining the condition and very often increasing the milk flow of cows. There is not the slightest reason why sheep should not be fed on ensilage. Where one cow could be kept one could keep seven to 10 sheep, and the net return would be much in favor of the latter. Another argument against dairying is the work that it entails. Dairymen taboo this, but it must be admitted that if kept on the farm in season and out of season, Sundays and holidays, a man will become stale, and his nervous condition will be in such a state that a change will be necessary. To employ labor to milk cows does not pay at the present rate of wages—to keep a boy or boys is very unsatisfactory. Almost everything produced on the farm can be marketed on four legs by feeding to sheep. We know what peas will do ; we know also that oats possess an even more valuable feeding quality than peas. In last week's *Leader* there is an interesting article on the subject. The writer says that ½lb. of oats per day will maintain a sheep in good condition ; 1lb. will fatten any healthy store, and 2lbs. will top up a big wether for the prime fat stock market. Potatoes are relished by them also. Of the value of lucerne it is almost superfluous to speak, suffice it to draw attention to a statement that on 14 acres of lucerne at Messrs. Morphett's Woods Point Station, 3,500 were grazing. They were kept two days on a paddock and then shifted to a fresh one. Briefly, then, to summarise—25 sheep do not rob the soil of as much fertility as one cow. Sheep maintain and increase the fertility of the land, also they keep the paddocks clean. Where one cow is fed one can feed from seven to 10 sheep, returning a profit of £1 per head. The cost of attending to the sheep is much less, as one man can do it easily. Sheep make better use of the food given them and do not show their likes and dislikes in such a pronounced fashion as cows. The work of tending sheep is less laborious and infinitely more attractive than milking cows. In this district we are only just beginning to realize what our resources are. Not so very long ago no one thought of feeding his crop of peas to sheep. Here we can grow almost anything, the results varying a little according to the season, and it is my humble opinion that the farmers must keep sheep." Mr. J. Thomas said—"For the purpose of comparison I intend to restrict myself to a property of, say, 300 acres. On this land, under systematic farming (not the style we can see in our midst daily), I consider that 60 cows could be kept. By the term 'systematic' I mean the growing and conservation of fodder, keeping good cows, and properly controlling breeding so that each cow will have from six to eight weeks' rest before again coming in. Two months' rest will allow of the cows each being in the bails for something like 10 months, hence a herd of 60 cows will be necessary to insure 50 in milk. In addition to the herd of 60 milch cows, the dairy farmer should rear annually from 15 to 20 selected heifers, which in time would be used to replace the old or useless milkers. I would not recommend keeping bull calves, as I consider it more profitable to feed any surplus milk to pigs and a few selected heifers. Heavy milkers only should be kept, *i.e.*, cows which will yield from 550galls. to 700galls. per annum. Taking it at the low yield, viz., 550galls. per cow, this means 27,500galls., which, at say 6d. per gallon, gives a return of £687 10s. In estimating this amount I am valuing the milk for butter or cheese making; but if the farmer were living within reasonable distance of a city, his income would be about three times as much by the sale of milk. The separated milk or whey from cheesemaking would go a long way towards the upbringing of heifers, which should be worth from £2 to £3 when 12 months of age. If 20 heifers were reared each year I have no hesitation in saying there would be a profit of £50. In addition, I see no reason why a farmer could not have, say, four breeding sows which could easily be fed from the refuse of the dairy. These, having two litters a year, averaging say at least seven, would give 50 pigs, which should realise £2 10s. at six months old—a return of £140. From these three items, viz., milk, heifers, and pigs we have the handsome return of £877 10s.. Against this we must debit the labor required for running a dairy, for which I allow three hands to assist the owner to milk and feed the heifers and pigs, for which I apportion £2 per week each, which means an expenditure of £312 per annum. Added to this expenditure I will allow the farmer £50 for the purchase of food for topping off his pigs for the market. After deducting these two items the dairyman should come out with a profit of £515 per annum. If the sheepfarmer can show a greater profit than this he is a lucky man. I do admit that the dairyfarmer has to invest more money on his land in the purchase of implements, &c., but notwithstanding that he will at the end of the year show a substantial balance in the bank." Mr. L. Frame assumed the case of a farm of 300 acres of fair average land in this district, one-third of which could be profitably cultivated. This 100 acres should be divided into four paddocks of 25 acres. The balance of 200 acres should remain as permanent grass land. The following rotation could be adopted on the cultivated area:—Peas, wheat, Cape barley, or Cape oats on the wheat stubble to be fed down with sheep, and natural grass for the fourth year. Whilst it would be preferable to allow it to remain out for two or three years, if well cultivated and heavily manured one year's rest would do. He would purchase from a reliable breeder 200 four or six tooth Merino ewes off shears. About March 1st these should be mated with Shropshire rams, the lambs being dropped at the end of July or August. By this time the oats or barley should provide good feed to keep the flock through September, at the same time saving the grass land until the oats or barley was done. This grass should keep the sheep going until the peas were ready to feed off and the lambs fit to wean. Part of the pea crop should be cut and stacked, as the damage by a heavy rain to the standing crop was too great to risk. Two hundred ewes should yield 160 lambs in a fair season, 150 of which should be put on to the peas. They should be ready for market during February or March, and if in prime condition should return 15s. per head in an average season, equal to £112. Wool from the ewes should return 7s. per head, a total of £70, making a grand total of £182. The advantages with these animals in so far as the farm was concerned, were that they destroyed weeds and wild oats, increased the fertility of the soil, and they involved little labor. Mr. B. Stephenson had had 25 years' experience of cows. A good animal would yield at least 600galls. per year, which, at 6d. per gallon, equalled £15. One man could easily milk 10 cows. When the cow became stale it could be topped up and sold for about £10. and a springer purchased for about £4 5s. Sheep had to be sent to the city to be marketed, and the prices varied considerably. One hundred acres should carry from 10 to 15 cows. Mr. J. Pope thought that if sheep were given the same care as cows they would return much more. Crossbred ewes were more profitable than Merinos.

One man, on 300 acres, could easily look after sheep; but four men at least would be required for cows. There was a great future for sheep in this district. Mr. G. Cleggett advised keeping the Shorthorn or Holstein if milk were the objective; but if cream were wanted the Jersey was the best breed to keep. Mr. W. Stephenson preferred sheep to cows; tuberculosis interfered very much with the latter. An experiment showed that certain ewes, which cost 8s., when fed on 1lb. chaff and 1lb. peas per day, in six weeks returned 13s. each. Mr. Monfries said 80 acres of mustard and rape fattened 1,500 sheep and showed a net profit of £450. Cows must be kept up. Sheep could be sold in the winter and more bought when the feed came. Mr. H. Jones thought oats were very good for feeding sheep, especially when they cost 1s. 7d. and peas 4s. 3d. per bushel. Sheep would clean up oat stubble before they touched the peas. Cattle did not like green oats. Mr. J. Pope said sheep were useful to turn back a rank crop. Mr. W. Stephenson had fed off his crop twice with sheep and the resulting crop was a heavier one still. Mr. Henshaw Jackson (Wool Expert) said the dairy cow could not be done without. There were dairy men and sheep men, each special people, and not to be compared. The result of experiments showed that 25 sheep per acre could easily be kept by intense culture. The fertility removed from the soil was the greatest in the case of the cow and least with the sheep. Fertility returned to the soil—most by the pig, then the sheep, and the cow least of all. The sheep returned to the soil from 70 per cent. to 90 per cent. of that which it took out. The cow removed from 25 to 30 times as much as the sheep. Sheep had never been treated as systematically as cows. The great point was the feeding. Chaff, peas, oats, and all grains were good, but the profit was missed if their ration were not balanced. In this district oats should be fed to the sheep. The animal should be credited with ¾d. per day for its manurial value. Sheep had been fed on 1lb. chaff and 2ozs. oilcake per day for 200 days, a daily cost of ·6d. per head for the ration. These animals returned a profit of about 5s. per head.

BLACKWOOD, April 20th.—THE FEEDING OF DAIRY COWS.—The Dairy Expert (Mr. P. H. Suter) delivered an address on this subject, and illustrated it with lantern views. At the conclusion Mr. Suter answered a number of questions asked by members.

MACGILLIVRAY, April 7th.—VINES.—Consideration was given to the question of cultivating vines. It was thought that the Doradilla would be suitable for local planting, as splendid fruit had been gathered from young vines of this variety during this season.

MYPONGA, April 8th.—IRRIGATION.—The Chairman (Mr. G. Hunt) contributed a paper on this subject, in which he dealt chiefly with the possibilities of irrigation in this district. He advised growing fodder crops and vegetables, and mentioned an instance of 64 cows being kept on 18 acres of irrigated lucerne. Mr. J. Müller delivered a short address on the various irrigation schemes, and dealt chiefly with the large plants on the River Murray. Members considered that the system adopted by gardeners along the Torrens Valley, where the land permitted of open drains, was the best, but in land which was liable to crack, sprinklers were favored, although these were hardly workable on a large scale.

PORT ELLIOT, April 18th.—EXPERIMENTAL PLOTS.—Mr. W. E. Hargreaves undertook to experiment with different quantities of manure and lime on fruit trees.

PEAS AND OATS.—Some members thought May the best time for sowing peas; others preferred June or July. Scotch Grey and Cape oats were thought the best for this district.

SOUTH-EAST DISTRICT.

COONAWARRA.

April 7th.—Present: 10 members and one visitor.

FARM IMPLEMENTS AND CULTIVATION.—Mr. L. Stapleton read the following paper:—"With our varied classes of soils and very mixed conditions of agriculture and horticulture, each class of implement is sometimes the best under that particular set of conditions. *Ploughs.*—The stump-jump is the most popular plough here, but this is so, not because it does the best work, but because it is the easiest to manipulate. From my own experience and from extended observation it appears to me that there are more faults than virtues in this class of plough. As far as I have seen, speaking of working in our stiffer soils—red, black, and chocolate—few seem at best to get an average depth of more than about 3in., and in a large proportion of cases about 1in. less than this. Then, because in this stiff compact soil the ploughs are always more or less on the jump they make poor work of inverting the furrow-slice, because the mouldboard is shaped to properly turn the sod only while the mouldboard is in the horizontal position. For this same reason these ploughs cannot properly pulverise the soil. The mouldboard loses all semblance of shape after a few yards have been gone over in our sticky soils. Set mouldboard ploughs are, speaking generally, the best if the nature of the ground allows their use, *i.e.*, freedom from stumps, roots, and stones. My own experience has been mostly with disc ploughs. They have a few faults and many virtues. Unless the scrapers are adjusted so that they scrape properly and keep the discs quite clean, allowing not even a thin film of soil to adhere to the discs, they cannot work properly. Ploughing with dirty discs bears the same relation to ploughing as a dirty and sticky spade bears to digging. Disc ploughs can be used when the soil is fairly wet, because, unlike the mouldboard ploughs, there is nothing to slide on the ploughed furrow and so compact it to dry into hard clods. If the scrapers are properly adjusted the draught is very much less than with other ploughs ploughing the same depth in stiff, compact, and sticky soils. Stubble can be ploughed in much more easily than with other ploughs, and this ploughing in of plenty of straw and rubbish is, I think, a great need with our stiff and so easily compacted soils in order to make them more mellow, more easily worked, and to allow of better aeration and surface drainage. They are, however, more difficult in turning if the ground is being ploughed in lands; and they vary greatly in the width and depth of cut according to the varying nature of the soil. *Harrows and Drills.*—The zig-zag or diamond harrows makes a level, but very shallow, surface on the ground, and is easily choked up with rubbish. Stump-jump harrows are light of draught and do not collect rubbish. Lightness of draught in harrows is, however, in my opinion, not a good point; as it is proof that they are not doing much work. I find the lever harrows best, if under all conditions the teeth are set more or less slanting in a backward direction. They seem to go into and comb through the soil better than either of the other two kinds mentioned. They are not so rigid as the zig-zag, but more so than the stump-jump. The rigidity of the first seems to make them lively and jumpy, while the slackness of the stump-jump makes them offer little resistance to obstacles. The lever harrows are 'dead' and comparatively heavy of draught, but do good work in pulverising the soil, and in dry weather can be used successfully on pretty rubbishy ground. The hoe drill is the better under general conditions. The make of hoe drill that I have been in the habit of using successfully negotiates rubbishy ground if the ground is dry enough on the surface to be in proper order for drilling. *Cultivators.*—With cultivators my experience has been limited mainly to disc implements, and as far as I have seen there is no implement to take their place for making a finely pulverised and mellow bed; but unless used only when the soil on the surface is dry the discs get a coating of moist soil on them, and then the implement is useless for good work. When a crop is to be put in early in the season I think a tine implement should be used, because it leaves the soil more or less lumpy on the surface, and so it does not set down so hard after long-continued wet weather. If the crop is fed off a roller and then harrows may be put over this lumpy surface, and a good new top put on the ground again to assist in carrying the crop through a dry spell in the spring. The tine cultivator, with the tines arranged along a diagonal beam, one behind the other, does not choke with rubbish so easily as the others. Spring-tooth cultivators are not of much use on the stiff compact soils in a general way, but are very useful for summer and autumn cultivation of fallow ground, especially for destroying sorrel."

GLENCOE (Average annual rainfall, 38·84in.).

March 4th.—Present: five members.

Farm Fences.—The Hon. Secretary (Mr. G. F. Ferguson) read a paper. He said—"It may be taken for granted that fences erected will be influenced by the timber available. In some districts it is almost impossible to get timber suitable for posts, and in these circumstances iron posts are the best kind to use. In our district, however, we are supplied with stringybark timber of good quality. Care should be exercised in selecting the trees for splitting. The quality of the timber is of far more importance than the size of the post. Young timber has so much sap wood that when the post has been erected a couple of years and the sap wood has rotted away, the post is quite loose in the ground, and it is a difficult matter to tighten it. A post measuring 6in. by 4in. at the small end is large enough and will last as long as one 8in. by 4in. In days gone by fences were unnecessarily high, but we have gone to the other extreme now, and a great number of fences are too low. Consequently stock reach over them and damage both the fence and the crop. There are practically only two kinds of fences erected in our district, namely, sheep-proof fence of five plain wires and one barb, and rabbit-proof fence of wire netting with a barb above. The question in the first place, is—what height can we make a fence with six wires and still have it sheep proof ? A fence 3ft. 9in. high with a gauge as follows, is suitable:—Height of first wire from the ground 8in., and the spaces between the other wires 6in., 6in., 7in., 8in., and 10in. respectively. Some may object that a wire 8in. from the ground will allow sheep to crawl under, but if with a single furrow plough we throw a furrow against the fence, not only does this close up any low places under the fence, but the furrow is in such a position that the hind legs of a sheep would be in it if the animal attempted to push through. We would have a much better fence by using two barbed wires instead of one. Cattle will very often reach between the fifth plain wire and the barb on top of the fence. An inch hole should be bored for the second barb, and by just running a plain wire through the holes and attaching the barbed wire to this a horse can draw it in quite easily, without injury to the barbs. Do not use staples to attach the top wire. If the fence is on undulating land they are always drawing out and are a source of trouble. Bore a hole 2in. from the top of the post, put a length of No. 12 galvanized wire through and twist this round the barbed wire on either side of the post. No. 8 galvanized wire and 12 x 3 barbed wire are the most serviceable. The 14 gauge barb wire is too light, and is easily broken. Be careful to note the quality of the 12 gauge barbed wire when purchasing, as there are some brands with barbs so short as to be of very little moreuse than a plain wire. The question of using netting of 17 or 18 gauge, 36in. or 42in., 1¼in. or 1½in. mesh is a matter that has to be decided according to the nature of the land and also according to the state of one's finances. Doubtless we all prefer the higher quality material. If using netting of 36in. width I would fasten it to a plain galvanized wire on top and put a barb wire a few inches above it, allowing for the netting being sunk 6in. into the ground. It means that if a barbed wire is put at the top of the netting and another on top of the post, the fence can only be 3ft. 6in. high when a space of 12in. is left between the barbs, and that is too much. For that reason I would attach the netting to the plain wire and put two barbs above. If we should be careful to use sound and matured timber for posts, we should be even more careful in the selection of the strainers and corner posts. I believe in having plenty of timber in them. A post 18in. to 2ft. or more at the small end, sunk 3ft. in the ground and securely rammed will not pull over easily with the constant strain of the wires. I prefer split posts for strainers with struts 12ft. long and 6in. in diameter at the small end. We are making a mistake in not using more droppers in our fencing operations. If we used three posts to the chain with three light droppers 5ft. 6in. apart between each, fences would be more cheaply erected, there would be less damage done to the wire in case of fire and repairs would be cheaper to effect, and all without lessening the sheep-proof qualities of the fence. Good fences mean good stock and help to promote that friendly feeling that should exist between neighbours, while bad fences are indicative of careless farming and are a source of trouble and irritation to all concerned. But do not erect good fences and then have a barbed wire entanglement for a gateway." In the discussion that ensued Mr. W. Holloway said that he believed in putting four posts to the chain with one dropper between each. He did not like the gauge for the wires as indicated in the paper. He placed the first wire 6in. from the ground, and the next three wires each 6in. apart. He thought the sheep would crawl through if the spacings were greater. Mr. F. A. Telfer considered that dropper fences were all right in grazing country, but not in Glencoe. The droppers caused the fence to sag. He preferred all posts 8ft. apart. Mr. A. Dow had found 14 gauge barbed wire unsatisfactory, and was replacing it with 12 gauge. Mr. T. F. Gratwick considered that it would pay to use 17 gauge netting rather than 18 gauge.

KEITH (Average annual rainfall, 19·20in.).

March 7th.—Present: six members and one visitor.

Sowing and Harvesting Wheat.—Mr. Lill contributed the following paper:—"The farmer should take the utmost precaution in the selection of seed wheat most suitable for the land in which it is to be grown. Some varieties of wheat will yield better on some classes of ground than others. The most popular varieties in our district are Federation, Bluey, Clubhead, and Bunyip. The first three, sown properly, will yield up to expectations on any class of soil. Bunyip, although a good yielder, is not a good standing wheat, and, in my opinion, seems to do better on the heavier ground. Every care should be taken with the seed. One year's seeding means several years' weeding if good, clean wheat is not sown. With regard to manure, nothing less than 100lbs. should be used on the sandy soil, and from 70lbs. to 80lbs. on the heavier land. With good seed on clean land and the quantity of manure stated above, the result is almost assured. The next question is harvesting. The harvester, both as a time and labor-saving machine, has been a great success; now the reaper thresher has come to take its place. The average cost of a harvester is about £90, against £130 for the thresher. Is the extra cost necessary, when for a much smaller sum we can get a machine to do the work equally as well? The only advantage with the thresher, as far as I can see, is amongst star or Scotch thistles, and in a badly tangled crop. The first two, if farming is carried on as it should, ought not to be there, and the best way out of the last difficulty is to sow wheats that are not liable to go down. There are plenty of varieties, such as Federation or Bluey, that will yield as well and stand for weeks. Another question raised in favor of the thresher is that of saving grain; whether such is the case I am not in a position to say. The thresher, no doubt, will do good work in, say, a 30bush. crop of average height on good ground, but to do good work on bad country and in a poor crop is just a bit too much for it. The harvester will work equally as well in a 5bush. as in a 35bush. crop, and is much better suited to our class of country." Mr. Shannon thought the reaper thresher wasted less grain than the harvester, and was lighter in draught. Members advised the application of from 40lbs. to 100lbs. of super. per acre, according to the nature of the land.

MOUNT GAMBIER (Average annual rainfall, 32in.).

March 14th.—Present: 15 members.

Life Member.—Sympathetic reference was made to the death of Mr. J. C. Ruwoldt, a life member, who, during his lifetime had done a great deal in the interests of the Branch.

Agriculture, Past and Present.—Mr. C. T. Major contributed a lengthy paper, in which he contrasted conditions of working the soil 50 years ago and at the present time. Within the last two decades, he said, the application of chemistry to agriculture had done a great deal. The newer ideas of farming aimed to increase, or at least to maintain, the fertility of the soil. On the higher class lands the importance of this had hardly been realised. It was doubtful whether the richer soils in this district were used to fullest advantage, whether the sheep on the mixed farms were of the best quality, and whether the dairymen took the trouble to test their cows. There might be room for the extension of mixed farming, and no doubt fodder crops could be profitably grown on land that was now carrying grain crops. The future promised good prices for fat stock. In discussing the subject Mr. J. Botterill said dairying was more behind than any other department of agricultural work. Mr. Buck agreed. More rigid inspection of dairies was advisable. Mr. Sassanowsky said there was room for intense cultivation on the poorer lands of the district. Large areas could be improved 50 per cent. by the use of manures. Mr. Fowler mentioned that approximately 850 tons of seed potatoes had been imported last year. Their methods of keeping seed were somewhat lax. Mr. Major, in reply, mentioned that about 10 years ago he tested a herd of 12 or 15 cows. The results of the tests showed that his opinion of the value of the animals before they were tested was quite wrong.

MOUNT GAMBIER (Average annual rainfall, 32in.)

April 11th.—Present: 13 members.

Conference of South-Eastern Branches.—Mr. A. A. Sassanowsky, who had attended the Conference as a delegate of the Branch, delivered a lengthy and interesting report of the proceedings. Discussion followed with reference to growing fodder crops in the district. Mr. E. F. Crouch said that generally turnips would not do well in this district, although they might be grown on the damp land. He had grown good crops of rape in the district, but only when heavy December rains fell. Kale and chou moullier had both done well, but they were somewhat late. Italian rye grass was practically useless in the second year.

NARACOORTE (Average annual rainfall, 22·60in.)

April 11th.—Present: nine members.

Experimental Plots.—Mr. S. H. Schinckel undertook to conduct wheat variety tests on behalf of the Branch.

South-East Conference.—The Branch's delegate to the Conference of South-Eastern Branches, held at Millicent (Mr. W. E. Rogers), delivered an interesting report on the proceedings. In discussing the subjects raised, Mr. C. Bray mentioned that he had tried fodder crops, *i.e.*, rape, kale, sorghum, and maize, with rather indifferent success. Lucerne, however, had done splendidly. Mr. Schinkel had put in chou moullier last year.

It fed three and a half sheep, besides cattle and horses, to the acre, and did not interfere with the following crop. On the stubble four sheep to the acre were fed on chou moullier and kale. He had sown one or two crops of rape, but not with success. Mr. W. H. Smith mentioned that he had some fine self-sown plants of chou moullier, which had reached a height of 2ft. 6in.

Rope Making.—Mr. C. Bray contributed a paper. He had made a practice of utilising binder twine, after it had been cut from the sheaves, for the purpose of making rope, on such days in the winter as were too wet for ordinary work. He undertook to demonstrate to members the method of manufacturing the rope.

Life Members.—Messrs. A. Caldwell and S. H. Schinckel were congratulated by members on their appointment as life members of the Bureau.

WIRREGA (Average annual rainfall, 19in. to 20in.)

March 11th.—Present: six members.

Common Ailments of Horses.—Mr. C. Meier read the following paper:—"The most important point in connection with farm horses is the treatment of mares at foaling time, as often a little attention at this time may save pounds. In my opinion mares should be worked lightly well up to foaling, but never in shafts or the centre of a team, always on the outside. Within 24 hours of foaling wax appears on the teats of the mare. She should be kept away from other horses, especially from colts, as she is liable to get kicked or otherwise knocked about. If the mare in the act of foaling has difficulty in passing the foal help should be given, and the foal pulled gently, but firmly away, always pulling downwards, never upwards. Foals should be watched for the first few days. When the foal is unable to pass any manure the fingers should be dipped in salad oil, inserted in the foal, and the hard lump of manure pushed backwards. After it was released the oil would allow the manure to pass. In cases when the navel cord does not come away from the foal, it should be thrown and the cord tied tightly about 2½in. from the animal's belly with a piece of clean thin twine, then with the sharp scissors the cord should be severed about 1in. the other side. When horses gripe through such causes as over quantities of green feed, change of chaff, &c., give them a drench consisting of one and a half tablespoons of baking soda in a bottle of milk. Sand is shown by the horse grabbing intermittently at his stomach. Give a drench of ¼lb. coffee, boiled and strained, to which is added two spoonfuls of baking soda. Give to the horse just warm. In the case of barb wire cuts, when not too big to stitch, wipe them over with a feather and a little kerosine, then on top of that apply a little bluestone solution, about the same strength as for wheat pickling. Before the above treatment cut away any loose hanging lumps of flesh with sharp scissors.

WIRREGA (Average annual rainfall, 19in. to 20in.)

April 8th.—Present: four members and two visitors.

Mallee Shoots.—Mr. H. Rogers read a paper, in which he said that to cut mallee shoots between the months of June and December was only to clear the land for the time being. They should be cut between the middle of February and the end of March, as the sap was then in the stems and the roots received a setback. Sheep had been found to eat the shoots just as they appeared above the ground, and for this reason it was advisable to get stock on to the land in this district as soon as possible.

KALANGADOO, March 14th.—Dry Bible.—Mr. T. Bott reported that he had treated an animal affected with dry bible with 1 pint of Stockholm tar mixed with 2 pints of fresh milk as soon as the trouble was noticed. The results had been satisfactory.

KYBYBOLITE, March 5th.—Manures.—Mr. Hahn initiated a discussion on the merits of A and B grades of manures. He had used both under similar conditions, but there had been no apparent difference in the crops. Mr. Bradley, also, had had the same experience. He would like to see the matter tested at the Kybyholite Experimental Farm. Mr. Schinckel preferred the A grade, because of the better analysis. He had never, however, tested them. The extra cost per acre, sowing at the rate of ¾cwt., only meant an additional 3d., and an extra 4lbs. or 5lbs. of wheat per acre at harvest would cover this cost. He contended that the better quality of the manure would produce this. He did not think this slight difference could be noticed in the standing crops. Mr. Scholz also favored the A grade.

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T. PASCOE,

Minister of Agriculture

POINTS FOR PRODUCERS.

Agricultural Machinery in Siberia.

A very important feature in the colonisation of Siberia is the organisation throughout the country of stores for the sale of agricultural machinery to the peasant population. From a small beginning in 1898 the organisation has rapidly assumed large proportions, and at the end of 1912 there were, at various centres east of Tchelyabinsk, sixty-seven depôts and 120 sub-depôts and agencies. The annual turnover continually increases, and attained in 1912 the sum of 8,438,000 roubles. The purchases of machinery in the same year were for an amount of 5,970,000 roubles, and the value of the whole stock on hand was estimated at 11,424,000 roubles, says the *National Review* (China). The machinery is sold on long and easy terms of credit, and the amount due from purchasers rose from 4,554,000 roubles in 1911 to 4,754,000 roubles in 1912. A good system of organisation minimises the number of bad debts. As far as possible, machinery of Russian manufacture only is sold by these stores, but the amount of modern machinery dealt with by them is very large.

Manuring of Malting Barley.

As a result of experiments carried out in connection with the Agricultural Institute of Giessen University, the following principles are put forward in a bulletin summarised in the *Journal of the Board of Agriculture* in regard to the manuring of barley for malting purposes :—" To obtain the best quality nitrogen should be available in minimum quantities ; this end may be most safely attained by the omission of nitrogenous manuring and by a liberal manuring with potash and phosphates. If the highest yield is desired it may be considered advisable to apply a nitrogenous manure. It should be remembered, however, that the largest yield is not consistent with the best quality ; there is nevertheless a point up to which nitrogenous manuring may increase the yield without leading to deterioration in quality. The attainment of this aim is dependent upon suitable manuring with potash and phosphates.

Veterinary Surgeons in England.

The President of the British Board of Agriculture (Mr. Runciman), speaking at a gathering of farmers held at Cambridge on March 28th, said one of the greatest rural problems they suffered from in England was the scarcity of veterinary surgeons. This was due to parents refusing to put their boys into the profession because of a belief that motoring had killed it, which was not true ; and the Government proposed to offer encouragement by remunerating more fully the cleverest of the young men who might come into the veterinary profession.—*Mark Lane Express.*

Agricultural Co-Operative Societies.

In 1901 there were some 25 agricultural co-operative societies in England. These increased in 1907 to 170. In 1913 the number of affiliated societies reached 530, or an increase of 385 societies in the six years.

Fruits, and Where They Come From.

In the course of a lecture recently delivered, Mr. E. A. Bunyard, F.R.H.S., is reported to have said that no traces of the fruits we now had were found among the debris that had been dug up at various ancient places, except the stone of the sloe. The plum, apricot, and fig, he continued, had come from Asia, *via* Greece, Italy, and France. The introduction took a long time, and in one instance it was 1,400 years from the time a fruit left its native country until it was cultivated in England. The fig was the oldest known fruit, but its origin was unknown. As to the strawberry, it was a mistake to suppose that it was a cultivated form of the wild fruit, for one could cultivate the wild strawberry and never be able to grow it any larger than it was at present. The improved form of the strawberry came to us from Peru, South America, although it was in the first instance taken out from the East.

Pig-Keeping by School Children.

The subject of agricultural education is at present very much alive in Kent, writes the *Agricultural Gazette.* Recently a county agricultural organiser was appointed to supervise courses of instruction throughout the county, and the Kent Education Committee constituted a special sub-committee for the purpose of supervising rural classes, and for the consideration of steps which may be necessary to increase the facilities for agricultural education in the county. But the most novel movement is that which came before the committee from Chevening, a parish near Sevenoaks, in which Earl Stanhope's demesne is situate. The managers of Chevening School had forwarded to the committee a proposal to establish a scheme of "co-operative pig-rearing," to be carried on in the school playground," but not to be included in the school curriculum, and the committee approved of it to a certain extent, but strongly objected to the scheme being brought into operation in the school playground. Sir Mark Collet, Bart., was, however, able to inform the committee that there was a misunderstanding, and that instead of the playground being used for a number of pigs only one was to be kept in the garden adjoining. With this information before them, the committee withdrew their objection to the scheme, and it will now in all probability go forward.

Dairy Instruction.

The rapid growth of the dairy industry in Ontario is due largely to the excellent system of dairy instruction maintained by the Government. There is now in force a system of sending specialists in cheese making and butter making to factories and creameries during the manufacturing season to assist the makers in the production of a better and more uniform quality of cheese and butter. Among the duties of these specialists is to inspect sanitary conditions and to give advice on the care and handling of raw material. The Provincial Department of Agriculture bears the expense of a staff of thirty-five dairy instructors, whose functions relate both to producers and manufacturers, and whose duty is to see that a uniformly high quality of dairy material goes out to the market. The method of dairy instruction now given in Ontario, the appointing of special officials to deal with udulteration of milk, and the holding of factory meetings and district dairy meetings have brought about a great improvement in a progressive and prosperous field of labor.—*Agricultural Gazette.*

Longevity of Goats.

The useful life of a goat, says the *Agricultural Gazette,* depends on its constitution, and also on the way it is looked after and fed. Good goats can be kept from 15 to 17 years, and even breed at that age. Yet we may state that these are exceptions which only prove the rule that goats may attain an old age if properly fed and well looked after. The Alpine goats give an average of from 900 to 1,200 pints of milk per annum, and, although not fattening up as readily as sheep, the goat is a fleshy animal whose value as a slaughtering proposition is not to be neglected. We must, in conclusion, say that the goat is a very useful adjunct on any well organised and conducted farm—(1) For her production of milk ; (2) for the quality of that milk in the rearing of infants ; (3) for the conversion of that product into cheeses and the creation thereby of a real and genuine industry ; (4) for the great help cattle breeders will derive therefrom in the rearing, at a small cost, of their calves when their cows' milk is insufficient.

Fighting Insect Pests.

More than half a million of dollars is expended annually in the work of endeavoring to control the scale and other insect pests that infest the southern California citrus groves. This amount includes only what is actually expended in fumigation and spraying and does not, says the *California Fruitgrower*, take into consideration the loss of fruit from improperly treated trees, or trees not treated at all. Furthermore, each county maintains a horticultural commissioner, and many of them a corps of inspectors, primarily on account of insect enemies.

Australian Handbook of Meat Inspection.

Received the "Australian Handbook of Meat Inspection," by Dr. J. Johnston, M.D., C.M., D.P.H., &c., of Melbourne. This is a well-bound volume of handy size, and its contents, which should prove exceedingly useful to candidates for certificates of competency as meat inspectors and others interested in meat inspection, are effectively illustrated and concisely arranged. The inclusion of sections of various Acts relating to meat inspection in Australia should enhance its value as a textbook to those intending to qualify as meat inspectors in the Commonwealth.

Imports and Exports of Fruits, Plants, etc.

During the month of May, 1914, 1,496bush. of fresh fruits, 5,948 bags of potatoes, 128 bags of onions, 14,494bush. of bananas, and 82pkgs. of plants, seeds, and bulbs, &c., were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these, 972bush. of bananas and 40bush. of oranges were fumigated, and 446bush. of bananas (over-ripe) and 88 bags of potatoes (diseased) were destroyed. Under the Federal Commerce Act, 3,130bush. of fresh fruits, 1,010pkgs. of dried fruit, 124pkgs. of preserved fruit, 53bush. of lemons, 13pkgs. of plants, and 14pkgs. of seeds were exported to oversea markets during the same period. These were distributed as follows :—For London, 1,035bush. of apples and 5pkgs. of dried fruit ; for Vancouver, 600pkgs. of dried fruit ; for South Africa, 405pkgs. of dried fruit ; for India and East, 2,095bush. of apples and 108pkgs. of preserved fruit ; for New Zealand, 53bush. of lemons, 13pkgs. of plants, 14pkgs. of plants, and 16pkgs. of preserved fruit. Under the Federal Quarantine Act, 3,639pkgs. of plants seeds, bulbs, nuts, &c., were examined and admitted from oversea markets.

Of Interest to Sheep Growers.

Mr. Henshaw Jackson writes :—

A farm without sheep may pay well, but the farm with a flock will pay better.

No matter what breed of sheep you keep, it is your business to see that it returns the maximum of profit.

A profitable sheep for the farmer is one that combines a growth of wool and mutton, making the most mutton with a good grade of wool.

When you send low-grade mutton to the Abattoirs you do not know how it will pan out ; but if you send the best, you do not have much uneasiness about account sales.

A nice round body, pink skin, with a clean face, and clear, bright wool, and sportive humor, are good indications that your lambs are doing well.

When you start in to improve your flock, do it systematically. Careful selection and proper handling will produce a higher standard for wool and mutton.

Breed only to first-class rams, and remember that while a sheep may be of the purest blood, its form and fleece may be so deficient as to render it unfit for breeding purposes.

Strict and careful attention to the improvement of sheep is repaid when you have produced a flock carrying high-grade fleeces and showing a well-developed carcass. When you have got this, you possess just about the most profitable animal in the world for his inches.

* * *

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

Replies supplied by Mr. F. E. Place, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.

"G.," Nantawarra, had a mare which after being ill a week died. The animal was in good condition, had smooth coat, and apparently suffered little pain. The dung was very dry, and on day of death she seemed in great pain, and did not want to lie down. Frequently passed very dark urine. Post-mortem showed all bowels surrounded by dirty fluid, with bits of matter floating in it. The contents of water gut were hard and dry; a little sand was found, and place of contact with sand seemed rotten and inflamed.

Reply—If the horse possessed an appendix this mare would have died of appendicitis; as it was she died from perforation of the caecum, the puncture of the bowel induced peritonitis, the fluid and matter, which resulted in the acute pain before death. Possibly a sharp strain had taken place before the illness was noticed.

"H.," Coorabie, drenched some horses with linseed oil. They coughed while being dosed, and laid down and gasped. They eventually recovered, but for several days after lumps of solidified oil came from nostrils.

Reply—Heads held too high while being drenched. Oil went into lungs. Discharge was not oil, but clotted fibrinous matter. Very lucky they recovered, generally die. Never keep on drenching a horse that coughs.

"J. A. H." has some sheep suffering from pizzle disease. He asks for a remedy.

Reply—This disease is the result of crystals blocking the urethra, the irritation causing a gleety discharge, all resulting in the swelling noticed. Sheep are more or less a nuisance to drench, but if they are few benefit will follow 20 drops of tincture of camphor given twice a day either in a tablespoonful of milk or smeared on the tongue with a little molasses. The pizzle should be well bathed with warm water and soda or lysol, and a little glycerine, 20 or 30 drops, injected up the tube. A lick of sweet bonemeal three parts, saltpetre one part, will assist in preventing the disease.

"W. J. K." had a draught gelding which was found one morning after a warm night tucked up and shivering, especially in hind quarters, the urine was scanty, high colored, and offensive. He improved after dose of warm brandy and saltpetre, gradually came on feed, and after a spell in paddock resumed work, but had slight relapse, which again yielded to saltpetre. He asks—(1) Cause of trouble ; (2) what is the correct dose of saltpetre for horse, and how often can it be repeated ; and (3) cure for horse suffering from chronic cough.

Reply—(1) The symptons point to congestion of the liver, indicated by the urine and mopiness. The treatment was correct, but it would have been better to have given two drams of chloride of ammonia instead of the saltpetre, and repeated it twice a day for a few days. (2) Saltpetre—A full safe dose for a horse is ½oz., which may be repeated in 24 hours, but it is better to give two drams (a heaped teaspoonful), and this can be given twice a day for a few days. (3) Probably due to broken wind, for which there is no real cure, although many are advertised. Relief may be afforded by feeding chaff and bran only well wet and in small feeds, with once a day 2ozs. (a wineglassful) of raw linseed oil in it. Sometimes improvement follows the use of 10 drops aconite morning and evening for a month or so.

A member of the Northfield Agricultural Bureau seeks advice concerning a pony which went off its feed, it breathed heavily and catchy, its nostrils were distended, and tips of ears very cold, it was restless but quiet ; pawed, laid down, and groaned, and its eyes were dull. It received nux vomica and arsenicum with little relief, but recovered.

Reply—The symptoms are those of congestion of the lungs ; the treatment was correct, but possibly carbonate of ammonia, one dram, twice daily, would have helped.

"N. B.," Nangkita, has an aged horse which backed over a bank and grazed its flank on the top of a low post ; since it has fallen away, is very weak and easily exhausted. It had urinary trouble, but that is now better. Two front teeth in top jaw are broken and black. He asks for treatment, and should teeth be removed.

Reply—The teeth need not be removed ; in fact would be better left. The accident has no doubt bruised and possibly ruptured an internal organ, possibly the liver or spleen. The following tonic might improve matters :—Sulphate of iron, 1dr. ; powdered nux vomica, 1dr. ; gentian, 1dr. ; sulphur, 1dr. ; sugar, ¼oz. ; making one powder, to be given once daily in the food for a fortnight.

" G.," Coorabie, has (1) a yearling gelding with soft swelling below stomach as big as a football; and (2) a stallion with scurfy hind fetlocks, worse in wet weather.

Reply—(1) This is a navel rupture, probably too big to be successfully operated on. Feel how large the hole leading into the stomach is, if less than 2in., operate as follows :—Starve colt for 24 hours, cast on back, push swelling (bowel) into belly, gather up loose skin and pierce with two wire skewers crosswise, tightly wrap about 3ft. of strong waxend round loose skin between skewers and belly, and leave to slough off in about eight to 10 days, when sufficient inflammatory tissue will have closed the rupture hole. If, however, it is larger than 2in. the procedure will probably result in the bowels coming out and the death of the colt. (2) Probably due to a mange mite (*Chorioptes*). Try dressing the legs daily with benzine one part and linseed oil four parts. Also give daily in the food about 1oz. of sulphur (a tablespoonful).

" M.," Coorabie, asks treatment for a filly foal with swellings on stifles as big as oranges. Swellings are hard when standing square, and soft when legs are relaxed. There is apparently no pain, but a stiffness and difficulty in rising. The foal was benefited by rubbing; trouble is worse on cold mornings. Is it muscular rheumatism ?

Reply—Probably rheumatoid arthritis, commonly spoken of as joint evil. If the swellings have not broken and discharged, which is possible, rub them daily with this liniment :—Camphor, one part; olive oil, two parts; oil of turpentine, one part.

" W. B.," Grange, seeks information as to artificial food for calves.

Reply—A standard meal and milk diet for calves is—milk, 3½qts.; water, 3½qts.; wheat flour, 10ozs.; ground malt, 10ozs.; potassium carbonate, ¼oz. Preparation—The flour is boiled with the water and half of the milk to form a porridge; when this is cold the other half of the milk, with the potassium carbonate dissolved, is added, and the malt stirred in. The mixture stands for half an hour in warm place, and then is boiled up again and strained. As milk is stopped off, 1oz. linseed to one pint of separated milk may be substituted; and later, as separated milk is lessened in quantity, the following meal may be boiled up to take the place of each quart of milk :—Rice meal or wheat starch, 1oz.; crushed linseed, 2ozs.; maize meal, 2ozs.; pea meal, 1oz.; commercial extract of malt or ground malt, 1oz. If prepared in bulk omit malt and add as the prepared fluid is cooling off.

" P. B.," Lyndoch, asks treatment for cows which changed from grass feed on to soursobs lost power of hindquarters, otherwise they appear well.

Reply—The paralysis probably arises from the action of the oxalic acid in the soursobs on the blood, so that the brain and spinal cord do not receive the nourishment they require from that fluid. Probably benefit would follow, the administration of 2ozs. twice daily of syrup ferri phos. co. in a little milk as drench and several quarts of limewater to drink.

" H. F.," Mount Barker, seeks (1) information in regard to chlorodyne for horses affected by colic, and (2) as to temperature of livestock.

Reply—(1) The various proprietary veterinary chlorodynes are prepared as cheaply as one can do so oneself. The following is frequently used :—Chloric ether, 1dr. ; spirit camphor, 1dr. ; ext. cannabis Ind., ½oz. ; sp. chloroform, ½oz. ; turpentine, ½oz. ; oil of peppermint, ½dr. Mixed makes one dose. Given in water or gruel. (2) A centigrade thermometer can be easily read because the range required is not great ; the following are equivalents in the Centigrade and Fahrenheit scales :—

C.	37	37·2	37·5	37·7	38	38·3	38·6	38·8	39	39·4
F.	98·6	99	99·5	100	100·4	101	101·5	102	102·2	103

C.	40	40·5	40·6	41	41·1	41·6	42	42·2
F.	104	104·9	105	105·8	106	107	107·6	108

Normal horse, C.38 ; normal cattle, C·39. To convert degrees Centigrade into Fahrenheit multiply by nine, divide by five, and add 32.

" G. W. W.," seeks advice concerning mare which is very much off color ; she has foal just weaned and has slipped another ; has high temperature, is stiff in her movements and the bowels are a trifle loose.

Reply—The symptons are those of laminitis after slipping foal ; the stabling and feeding on green barley are correct. Ten drops of tr. aconite in a little bran or molasses morning and evening for a few days till temperature falls, then 10 drops of tr. pulsatilla in the same way will do good. Moisture or Stockholm tar to the feet.

" T. H.," Iron Knob, has medium draught horse which is on saltbush, myall, and sandalwood feed, but gets two feeds of chaff a day, and yet craves for rubbish, bark off old rails, and so forth. He is losing condition, has a rough staring coat, grinds his teeth terribly, and is very sluggish. Water and dung seem all right, but there is a lot of both.

Reply—The symptoms point to abscesses of the stomach and liver, and probably the horse will die, in spite of treatment. It would be well to feed him on bran only for two days, and then give him a six dram aloes ball to purge him, feeding on bran and long hay for two days after ; then give him once a day a ball made of powdered nux vomica, gentian, saltpetre, ginger, of each one dram, and enough glycerine to make a paste—a ball every day for a fortnight. It is more than probable, however, that the disease has such a hold on him that treatment will not be of much use.

" A. B. F.," has some ewes in lamb which become suddenly ill, stagger and go blind ; the losses cease for a time after change of paddock, then recommence ; the ewes are on natural grasses springing in paddock ; the ewes are generally within a fortnight of lambing, and there is slime on the dung.

Reply—The symptons are of a disease common throughout Australia, like braxy, due to a special germ, the bacillus *oedematis malignae transudationis*. Prevention—Change paddocks every three days, as the germ is discharged in the slime, but is destroyed after some hours exposure to sun and air. A lick of salt and sulphate of iron is useful if the ewes will take it. Treatment—Bleed freely at the eye vein, and drench if feasible with 2ozs. of Epsom salts, or what is better, give a Cooper arsenical worm tablet. Treatment as a rule is not of much avail. Constant change of pasture is better.

" M. W.," Millicent, has three-year-old gelding with trouble akin to stringhalt when backing or turning, but not when going forward.

Reply—There is no cure for this affection, which results from degeneration of certain nerves; but sometimes the symptons may be lessened in severity by giving a purge of 5 drams of aloes, and following daily with a powder made of 1 dram nux vomica, 2 drams iodide of potassium, and ½oz. sugar; this may be given for a month or so once daily.

" R. J. R.," Edillilie, has foal, five months old, which eats very little, is very sluggish, and is always foaming at the mouth. Did excellently for three months.

Reply—Possibly teething troubles, and very probably long round worms in the small bowels. Get from the chemist 1 dram mercury and chalk, and put on the foal's tongue once a day, or if too shy on his feed, 3-5 grains, *i.e.*, as much as will lie on the point of a small penknife blade. If after a week of this there is not the desired improvement, ask the chemist for 12 powders each containing 1 grain arsenic, and give one daily.

" W. J. M.," Owen, wants advice concerning sow which is short of milk for three weeks after farrowing. She is a good, quiet, careful mother, but loses many pigs for this reason.

Reply—If possible feed milk freely to her. For a fortnight before and after farrowing let her have in a little milk before feeding each morning 10 drops of tr. belladonna, and each evening 10 drops tr. pulsatilla. She will drink both of these in say a teacup of milk.

" F. M. H." wants treatment for colt which was kicked on the inside of one of his legs between the hock and the stifle. The place swelled, and there is a yellowish discharge from the swelling.

Reply—Iodine resublimat 1dr. to one pint of methylated spirit will be a good dressing; if the discharge does not soon cease apply occasionally a pinch of chlorinated lime or soap extract. A kick in this position sometimes partially breaks the bone, and things seem to go on all right for a time, when suddenly after some weeks the animal is found with the leg hanging, the fracture having become complete. This accident must always be borne in mind.

" E. E.," Woodside, seeks treatment for mare suffering from what appears to be inversion of its vagina.

Reply—Having made sure that inversion of the vagina is the trouble, and that it is not a tumor growth, an astringent lotion, such as ½oz. of alum to a bottleful of warm water should be applied daily. The bowels should be kept loose by daily doses of 2ozs. or 3ozs. Epsom salts in drinking water, and 10 drops tr. pulsatilla might be put on the tongue morning and evening.

"J. J. F.," Coulta, lost about 100 sheep, presumably through their being turned into a paddock where there was more stinkwort than grass, the stinkwort being responsible. They fell down as in a fit and frothed at the mouth as if poisoned.

Reply—This weed at certain stages of growth will bloat sheep, and death is rapid, as described. Prevention is not to let them on to it when dew or rain has wet it, and where possible to let them have a bellyful of grass before they go on, then they can be gradually accustomed to it. Treatment is of little use, but ½oz. doses of baking soda or hyposulphite of soda dissolved in a little water may be of use on those not too far gone.

"J. J.," Forster, asks advice concerning cow which goes off feed and milk and loses flesh. This has been intermittent during six months.

Reply—Possibly hydatids on the liver. As she is not likely to do well, it would be better to kill her.

"S.," Forster, asks treatment for (1) cow which gives bloody milk when stripped, and (2) for foal which staggers and has been weak across loins for about three months.

Reply—(1) Probably diseased udder, mammitis or tuberculosis. If a lot of blood, dry off; if only a little, rub into the teat after milking an ointment made of vaseline 1oz., tr. arnica 1 dram. (2) Possibly met with injury, but more probably has an affection of kidneys due to a form of blood poison contracted in the womb. Rub back daily with warm olive oil, and give once daily for a fortnight a dessert spoon of syr. phos. Co. (Easton).

"B. B.," Koolunga, has draught filly, 2 years 8 months, with soft swelling in front of off hock, with similar ones each side of point of hock. He asks for treatment.

Reply—Bog spavin and thoroughpin, *i.e.*, bursal enlargements due to poor quality of oil secreted in the oilbags of the joint. On no account should so young a filly be worked, or the swellings will never be reduced. As blistering has failed, as it was likely to do, try a good thick plaster made as follows :—Stockholm tar, pitch, Venice turpentine, warmed together till thin enough to work. Put on a little, then some dabs of wool, more plaster and more wool, till about an inch thick, and turn out in a paddock of good feed for 12 months. The plaster will stick on for some months, and should not be removed.

GRADING LAND FOR IRRIGATION.

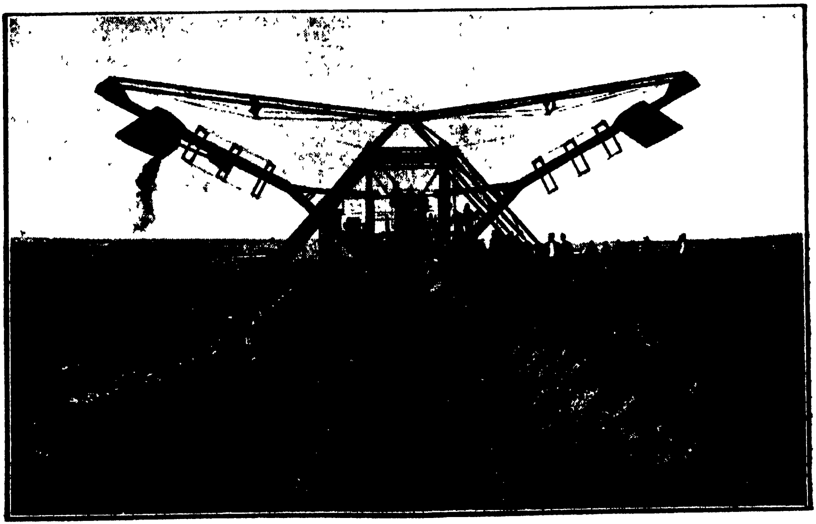
"H. F. C." seeks information as to best way of grading land for irrigation, the most suitable implements to use, and best variety of maize for feeding stock.

Reply—The Director of Irrigation (Mr. S. McIntosh) replies :—"I would suggest grading your land with a Dennis, Fewings, or other suitable grader;

if you have had no experience with this class of machinery, I would recommend the Fewings. If possible secure a surface fall of not less than 3in. to the chain. You cannot trust to the naked eye to give your levels, and would advise securing the services of some competent person to take such levels and furnish you with a sketch showing same. *Re* best variety of maize to plant for feeding stock, I would recommend American Horsetooth and Ninety Days. There are a number of other varieties on the market, but you cannot always get the seed true to name."

Killing a Pepper-Tree.

" H. B. C.," Solomontown, asks how to kill a pepper-tree without uprooting. Mr. G. Quinn, Horticultural Instructor, replies :—" The tree may be killed by injecting a solution of white arsenic into the stem. Holes may be bored with a fairly large auger into it in a downward sloping direction, and after filling these with the solution they should be plugged with clay or putty to prevent evaporation. Arsenic may be dissolved by boiling it in water with washing soda. A couple of ounces of arsenic and four ounces of washing soda would make a gallon of very strong solution. Care must be exercised in making and handling this solution, as it is extremely poisonous to all animal and vegetable life. Strong solutions of common salt or bluestone will kill the tree, but take longer to effect the purpose."



Excavator, Mypolonga Reclaimed Area.

TUBERCULOSIS IN DAIRY CATTLE.

By F. MURRAY-JONES, Assistant Government Veterinary Surgeon.

Tuberculosis is a disease of the greatest importance, not only from the fact of the economic losses to cattle owners, but also owing to its prevalence in the bovine species and the consequent serious bearing on the health of mankind through consumption of milk and meat. The world's authorities of to-day are agreed that the consumption of milk from tubercular cows is a grave menace to the health of mankind, particularly so in the cases of the very young and the aged.

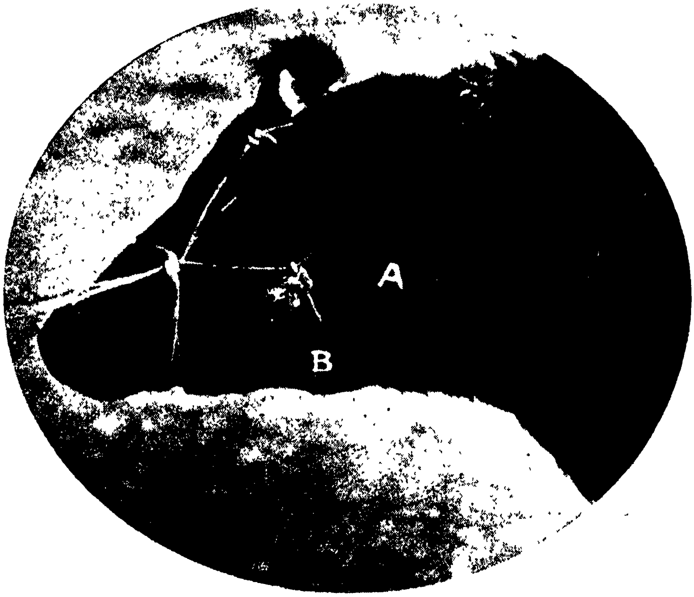


FIG. I.—A TYPICAL "LUMPY" ANIMAL.
A Tubercular subparotid lymph gland. B Tubercular submaxillary lymph gland.

The population of Adelaide and its adjacent suburbs are protected from one phase of this danger (*i.e.*, consumption of tubercular meat) by an efficient system of meat supervision. However, another aspect is the health of the animal responsible for the production of our milk supplies. This remark is not intended as an alarm note, but is made simply to direct the attention of dairy cattle owners to the need for greater vigilance, care, and attention in respect to any indication of tubercular trouble in individuals of their herds, and to suggest measures of co-operation with the officials at present responsible for their supervision, toward one end, namely, the eradication of the disease. The Stock Department is seizing this opportunity of placing before those interested the real significance of this form of the malady, and at the same time directing the attention of stock owners, by practical suggestions, to the best means of safeguarding their own, and at the same time others' interests in the detection and elimination of this disease in their herds.

The dairy cows of South Australia may be divided geographically into metropolitan and country residents, but the percentage of tubercular animals in the one area must not be quoted as the index of the other. *E.g.*, because one hears occasionally of several animals in a metropolitan herd being tubercular, it certainly must not be taken to convey that this represents the state of every metropolitan herd, or can it in any way be made to represent the state of herds existing in the country. Experience and authority agree on this point, that the closer animals are herded together, especially under doubtful hygienic conditions, and the closer they live to mankind, the higher will be the percentage of disease. On the other hand, the wider animals graze and the less frequent their contact with mankind, the smaller the number affected. The doctrine of tubercular emancipation is being preached by the authorities of the leading countries of the world. Even England, conservative as she has been in the past, has now fallen into line and has passed an Act known as the Tuberculosis Order. American cattle men are beginning to appreciate these forward movements, and have refused to admit any animals that have failed to pass the tuberculin test.

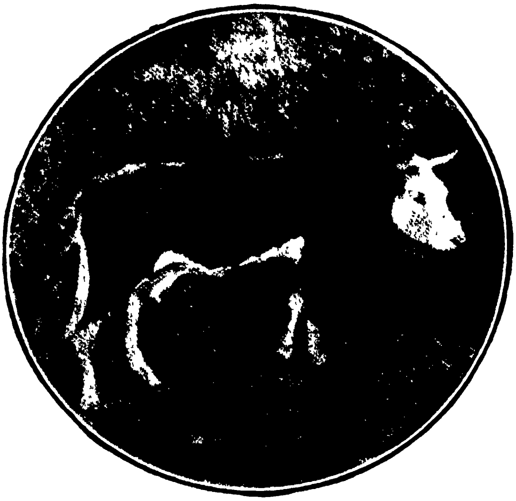


FIG. II.—A TYPICAL "WASTER" OR "PINER."

CAUSE OF TUBERCULOSIS.

The causative agent of this disease, the bacillus tuberculosis, was discovered by Koch in 1882. It is a slim, straight rod measuring 2·5mm. to 3·5mm. long, and ·3mm. to ·5mm. thick. It grows on blood serum in from 10 to 14 days, but will not grow in ordinary agar or gelatine. There are three varieties of bacillus tuberculosis, *i.e.*, human, bovine, and avian. The bovine is shorter and thicker than the human; it is more virulent for cattle than the human, *e.g.*, innoculation of this form into cattle produces generalised tubercular, but innoculation of the human only produces a local form. An important point is that outside the animal body the organism, if exposed to direct rays of sunlight, are soon killed. The dried expectorate from the cow containing the organism has been proved to remain virile for over 150 days. Sunlight, ventilation, and disinfection are the enemies of this organism.

FIG. III.—A SUSPICIOUS CASE.

PREDISPOSING CAUSES.

Sufficient for the purpose of this article the predisposing causes may be summoned up in two words—constitution and environment.

It is a recognised biological fact that the finer or higher the standard of the breed, the less resistant is the subject to an invasion of this character. Some breeds, like the Jersey, seem less resistant than others of a coarser type to the disease. The inference is not that Jerseys are in the ascendancy so far as percentage, but when subjected to condition of infection are less able to resist. As man has sought, by a system of selective breeding and domestication, to produce an animal on the lines of a milk machine, he has largely reduced that character of hardiness once possessed by the bovis under their natural condition.

Environment.—This plays a much larger part than that of so-called heredity. Cases of congenital infection are occasionally met with, but these are due to infection direct from the womb, or by portal blood stream. The retention of diseased animals in a herd has been found after a period of six to seven months to have infected their companions. Insanitary buildings, faulty drainage, filthy feed boxes, indifferent light, cowyards with several inches of dry manure upon which these animals recline, inhaling the dust, and infecting the udder by way of the teats, are, in my opinion, the factors predisposing towards the disease.

MODE OF INFECTION.

This occurs mainly by one of the three following channels :—(1) Inhalation, (2) ingestion, (3) coition.

Inhalation.—In adult animals the most common mode of infection is by that of the lungs. This frequently occurs as the result of close contact with diseased animals. In old cows examined at the abattoirs and slaughtery houses the lesions in the lung glands and lung tissue bear ample testimone to the path of infection. In this way one can easily understand how on, diseased animal introduced to a herd can, in a comparatively short time-infect a number. Cattle do not expectorate in the way that human beings do, but as the result of the explosive effort induced in coughing, a fine spray of moisture is discharged into the atmosphere in the form of small globules. These globules have been proved at times to contain the tubercle organism. These globules descend over herbage, fodder, fittings, as well as upon the companions of the diseased animal. Again, a percentage may dry, and in the form of fine dust be inhaled by other members of the herd. The chances of infection in this way can be easily understood when it is remembered how often we see three bails provided for 15 to 20 cows, and when it is the

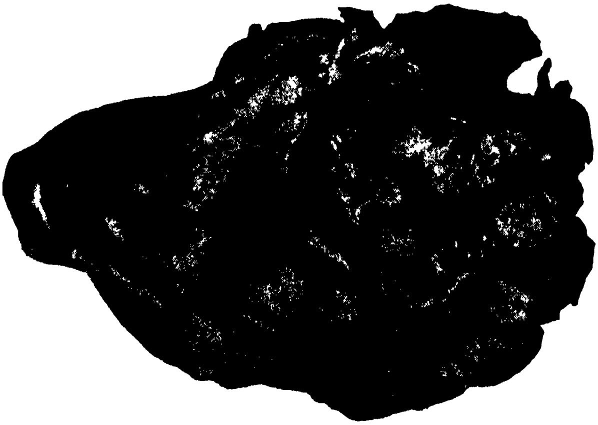


FIG. IV.—TUBERCULOSIS IN THE HEAD.
A A Tubercular subparotid lymph glands.
B B Tubercular throat glands (retropharangeals).

exception rather than the rule to observe any precaution being taken along the line of cleansing or disinfecting the bail and adjacent fittings.

Ingestion.—In old animals infection in this way is generally in the nature of a secondary infection. By this is meant that the animal has had the infection already in the lungs, and that during the progress of the expectorate from the lungs as it reaches the mouth it becomes swallowed, and so the organism is carried along the digestive tract with all the possibilities of infecting. the stomach, bowels, &c.

In Victoria, prior to the introduction of the Dairy Supervision Act, it was found that a common cause of bowel infections in calves and pigs was feeding unsterilised separator milk that had been returned from the factory. This occurred in the following manner, *e.g.* :—Twenty farmers contributed milk to the factory. Unknowingly, one of them contributed milk from animals suffering from tuberculosis. At the factory the milk from the 20 was mixed. After the process of separating was completed the separator milk was run

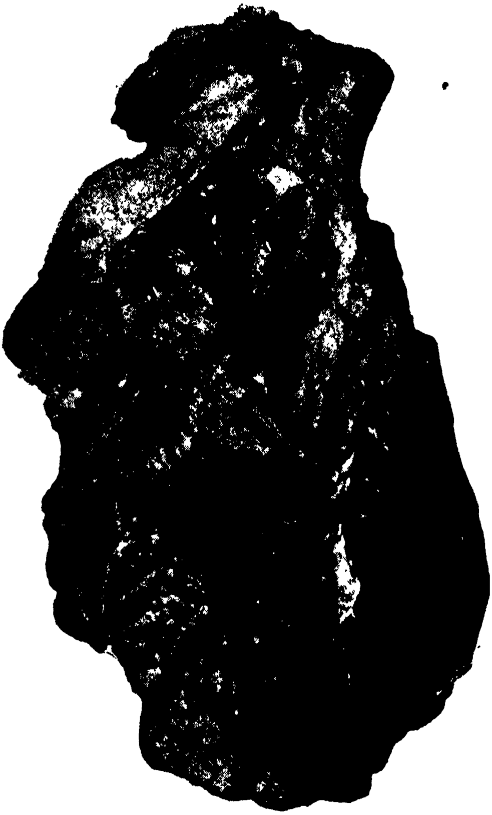


FIG. V.—TUBERCULOSIS IN LUNGS.
A A Tubercular lymph glands (anterior mediastinals).

into a common receptacle, from which each man collected his share. What did this mean ? It meant that infected milk left one farm but was distributed again to 19 others, and, being fed to calves and pigs, no doubt largely contributed to the percentage of the disease in these animals. A real menace to the health of the dairy cows of this State exists through allowing animals to feed from filthy boxes, often caked with dried discharges from earlier feeders whose health in this respect was perhaps of the most indifferent character.

Coition, or Sexual Contact.—Infection in adult animals may be spread by means of the bull during service. Occasionally one meets with a cow whose uterus on *post mortem* proves to be one mass of tubercular infection. On inquiring the history of this animal, you learn perhaps from the owner that she could never be made to carry a calf, although a frequent visitor to the bull. You may also learn that she has been discharging, sometimes scantily, at other times freely. Bearing this in mind, it is an easy matter to imagine how a bull that has served such an animal could again in turn convey infection to other animals.

Congenital.—Cases have been noted of animals being born with evidences of the disease. This has been caused probably by the direct contact with an infected womb during the fœtal life.

SYMPTOMS.

The disease is usually insidious in its development, and slow and chronic in its course. They may be in the acute or early stages, or the chronic or advanced form. In the initial stages the presence of tuberculosis may be overlooked, and not uncommonly well marked and advanced lesions may be found in slaughtered animals that appeared perfectly healthy in life. As the pulmonary or lung form of the disease is most commonly met with, the symptoms, as might be expected, are chiefly in connection with the respiratory system.

In popular language the following terms are used by cattle men to indicate certain classes of animals showing certain deviations from the normal :—(1) The waster or piner ; (2) the lumpy ; (3) the cougher ; (4) the roarer or snorer.

The Waster or Piner is an animal that may be suffering from the disease without showing any definite symptoms. It is usually unthrifty, remaining poor in spite of good feeding, tucked up in appearance, arched in back, head carried forward, eyes sunken, face muscles shrunken, coat rough and staring, legs " proppy," altogether a miserable and dejected animal. (See Fig. II.) Being moved quickly may give rise to a short, dry, intermittent cough, easily induced, especially early in the mornings if the weather be cold. This type of animal should be regarded with the greatest suspicion.

The Lumpy (see Fig. I.).—This term is meant to convey that the animal is suffering from a form of glandular tuberculosis, involving the " kernels " or lymph glands of the head or some other part of the body. The most common region is that of the head. Frequently the parotid gland below the ear, or submaxillary below and on the inside of the angle of the jaw, or the retropharangeal gland situated at the base of the tongue. When the latter are enlarged they may be distinctly felt filling the space between the lower jaws. Often the term is used to indicate an enlargement on the jawbone itself, which is frequently of an actinomycotic character. Again, these lumps may be seen in other regions of the body in the position of the lymphatic glands, *e.g.*, (1) along lower part of neck, cervical glands ; (2) at point of shoulder, prescapular glands ; (3) in flank, precrunal glands. One of the most important situations of this lumpy condition is the mammary gland, or udder. This gland is situated high up at the back of the organ, and the best method of detecting it is to examine the " bag " after milking. The person examining should stand at the side of the hind limb, one hand resting on the rump, and the free hand to be used in carefully manipulating the udder at the " back show " in the centre line high up. Should this gland appear enlarged and hard, somewhat resembling a walnut or golf ball, immediate steps should be taken to have the animal examined by a competent person. If neglected this may extend to other quarters of the organ, with serious effects on the milk, which may become infected with the tubercle organism. The term " lump " is often used to describe the swelling caused by a grass seed abscess in the region of the throat. A rough guide is as follows :—In the case of a grass seed abscess, there is heat, pain, and a tendency to point or suppurate. After breaking, the skin at that spot is found considerably thickened. The

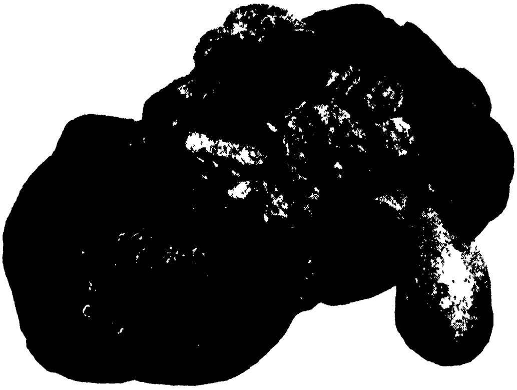


FIG. VI.—TUBERCULAR INVASION OF LIVER.
A A Tubercular glands (hepatic-portals). B Gall bladder.
C Tubercle distributed throughout liver.

more serious lumps are usually hard, "cold," and, in the case of tuberculosis, not inclined to suppurate. But in cases of actinomycosis there may be a suppurative discharge.

The Cougher.—By this term we refer to an animal whose cough is frequent, and may be short and dry or prolonged and moist in character. This is generally an advanced case, and there is usually a loss of condition. Nevertheless, we frequently meet with animals which, in spite of these symptoms, maintain condition, and yet on subsequent slaughter present extensive lesion. The appetite may be slightly impaired. Usually there is not any nasal discharge, and any expectorate is generally swallowed when it reaches the pharynx (gullet). The significance of this swallowing is that the expectorate generally contains the tubercle bacilli, and so secondary infection of bowels may take place. As this form of the disease progresses the animal becomes more emaciated, the eyes become sunken, followed by anæmia and general debility.

The Snorer or Roarer.—This symptom generally follows as the result of the glands at the base of the tongue (retropharangeals) becoming involved, and a distinct snoring sound is produced in moving the animal. When the larynx or voice box is affected by the formation of this tubercular tumor, a distinct roaring sound follows.

THE OWNER'S RESPONSIBILITY.

It must be carefully borne in mind that it matters not where the lumpy conditions may exist, they must always be regarded with the gravest suspicion, and in compliance with regulations under Stock Diseases Act are to be treated as notifiable diseases. ***Immediate notification to the local stock inspector, or to the Stock and Brands Department is necessary***

THE TUBERCULIN TEST.

This test is used for the purposes of diagnosis. The principle of the method consists in the thermal or temperature reaction which follows the introduction of a quantity of specially prepared glycerine extract of pure cultivation of tubercle bacilli. The test requires skill and knowledge in its use. In the hands of the untrained or inexperienced the results are misleading and absolutely unreliable.

PREVENTIVE MEASURES.

Hygiene.—In discussing this aspect as bearing a most important part in the spread or eradication of this disease, one cannot emphasise too strongly the necessity for a higher standard of hygienic conditions than at present exists as regards buildings, drainage, disinfection, light, and ventilation of places used for accommodation of dairy animals.

Buildings.—Many of the present day cowsheds were constructed probably from 30 to 40 years ago, without any pretence whatsoever to hygienic

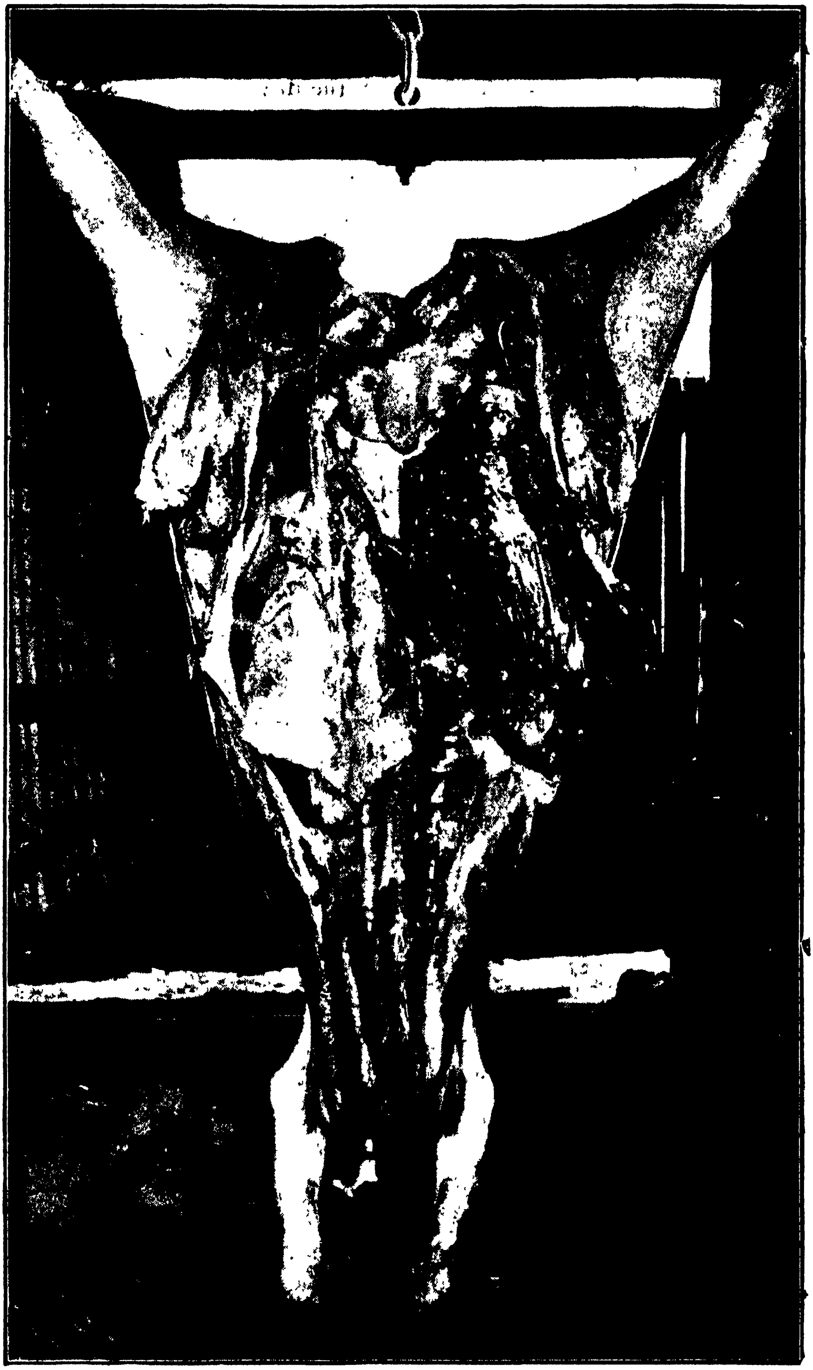


Fig. VII.—A Case Condemned for Generalised Tuberculosis.

principles. In many cases sheds accommodating from 20 to 25 cows possess roofs so low that a man of average height must stoop to enter; the stall accommodation so inadequate that it is almost an impossibility for a person to walk in and release the bail pin in order to liberate the cow; the floors are ill-drained, and the fittings corroded with the dust of ages.

Drainage and Disinfection.—These are phases that should receive the closest attention. In many obsolete sheds the floors are pervious, allowing absorption of the escaped body fluids. One effect of this is the pollution of the atmosphere breathed by the animals during detention, and another that accommodation is provided for disease organisms. A good, cheap, and effective disinfectant is the application of common lime, or the chloride of lime. The best way to use this is in the form of milk-lime, distributed with a spray pump. By this means it is an easy matter to disinfect floors, walls, and fittings.

Light.—All authorities agree that the influence of daylight has a beneficial effect on the health of the individual, whether that individual be human or animal. Sunlight has in a very short time a most destructive effect on the tubercle bacilli. There should not be any corner of a cowshed to which sunlight is unable to gain access.

Ventilation.—By this we do not mean draught, but simply the establishment of currents of pure air throughout a building by the provision of apertures provided at certain points; these being directed in such a manner as not to bear directly upon the animal within. A cowshed being open one way does not provide everything necessary. There must be a free circulation of pure air. How often does one find a cowshed cleanly in many ways but with a close and stuffy atmosphere, and the place black with flies, the latter often dropping into the milk cans waiting to receive the milk when drawn. On asking one owner why he did not have better ventilation, which would not only have sweetened the air, but also dispersed the flies, he informed me "that it remained so for the comfort of the milkers during the winter." This man was evidently quite oblivious to the real object of good ventilation.

In urging that efforts should be directed along the lines indicated by providing conditions that will make for an improvement in the general health of the dairy cow, and so ensuring a higher degree of resistance to this dreaded disease, one cannot overlook the good work that has been done in Victoria in this direction. On the introduction of the Dairy Act in 1906, dairymen in Victoria were strongly opposed to what they called newfangled ideas, but what do they say to-day ? The men whose opinions are worth the having are more than satisfied with the results. The latest statistics quoted by the Director of Agriculture (Dr. Cameron) and the Chief Veterinarian of Victoria show that in the districts where the Dairy Act is in force the percentage of tubercular cases are considerably lower than before, this being largely due to the improved conditions under which the dairy animals are being kept.

QUALITY IN SHEEP FOR MARKET.

By HENSHAW JACKSON, Wool Instructor, School of Mines and Industries.

Now that the breeding of lambs for market is receiving pretty general attention, and in view of the fact that prospects never looked brighter for mutton producers, both as regards local realisation and export, it is well to bear in mind what a big factor "quality" is in regard to cash returns. The price of mutton is affected and the difference between various lots of sheep marked by nothing so strongly as the quality of the animals, and striking instances of this can be seen at any metropolitan saleyard on a market day. It is often noticeable in various drafts of sheep or lambs how one man who produces sheep of the highest quality makes a success of the business, and always finds his drafts of fats keenly competed for, while another, who sends down to market something that he has bred, just because they can be called sheep, cannot make out why it is that none of his lot ever "go off" as prime.

In breeding either sheep or lambs for market, nothing is so essential to success as quality, maintained with the greatest possible uniformity throughout each draft. When sheep come under the hammer they are sold absolutely on their merits, being carefully drafted before offering, for mixed lots are an abomination. Any lots displaying quality, even if only medium in size, will sell as well as any others, and better than most, for should the market go up they are always in the van, and when a drop occurs still maintain a good position in the quotations. Many owners have a sprinkling of "tops" in their drafts, but rarely in big lots is every sheep prime. As the woolbuyers evince a predilection for the best clips, so do the butchers, and especially the exporters, lean in the same direction when buying sheep. This is a good thing, for when quality is in demand then it must be supplied, and in endeavoring to do this we shall raise the standards of our sheep.

Everyone who is any way interested in sheep-breeding knows what a big difference obtains between common and good sorts, and it should surely be the aim of all farmers to raise the best possible sheep, whether wool or mutton be the objective. To do this it should be an axiom to use none but the best rams, and thus sensibly increase the proportion of prime mutton at the yards and first-grade fleeces at the wool warehouses. Some sheepmen in the past have not always been so careful as they might in their breeding operations, and rams of no particular pedigree have been used, with results that, to say the least, have been disappointing. A ram may look very well in appearance, and will sire some good lambs, but perhaps his ancestors have been inferior animals, which fact, in the nature of things, debars him from proving as good a sire as is necessary for success. In the course of time all the shortcomings of his ancestors will be stamped upon his progeny, until the lamb crop degenerates into mixed mongrels, and sells accordingly. By using rams selected from known flocks with guaranteed pedigree, the reverse of this will be the case, and each season will bring a marked improvement in the flock, with correspondingly greater profits.

All over the world the improvement of sheep has been the result of careful breeding and selection, and a still greater general advance can be made in the future by doing away with low-grade sires. Anyone who thinks he can succeed with nondescript animals is bumping up against and running counter to the knowledge and experience of the greatest breeders, and his results cannot fail to disappoint him. A good many farmers still persist in using the ram that is handiest, and " blow the pedigree." So long as they continue at that kind of breeding, the general quality of farmers' sheep cannot be expected to improve. I trust that the importance of this question will be realised, and venture to say that in any district the man who pays the most attention to breeding is also the most successful farmer.

Do not be easily satisfied with any old ram, and do not buy him because you heard he has a pedigree, but go to a reliable breeder for your sires, and get a class of sheep that is true to type and of undeniable descent. When you go on these lines, and not until then, can you hope to produce lambs " like as peas in a pod." Because you breed sheep only for market is no reason for neglecting your breeding flock; and, apart from the ram question, you should cull out each year the ewes which drop the undesirable lambs, replacing them with the best of last year's lambing. In this way you will gradually get together such compactness and uniformity as at the beginning you would have thought impossible. Above all, do not rush things. Take time to achieve your object of quality. You cannot do it in one year, nor two, but get into the right groove and stick there, or rather, move along it. Get your breeding right on proper blood lines, and your sheep, with fair feeding, will do the rest.

There is a big field open to the lamb breeder, in which right principles backed up by unfaltering perseverance must inevitably bring the success due to quality.

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PICKLING OLIVES.

By H. E. LAFFER, Lecturer on Viticulture and Fruit Culture, Roseworthy College.

At this season of the year there are, in a great many places, quantities of olives which ultimately go to waste, and which with a little care may be turned into an excellent article of diet by pickling.

To anyone familiar with this form of pickle probably no other is so highly esteemed, but it may safely be said that a great deal might be done to make it more generally used. To those who have been tempted by the attractive appearance of a ripe olive so far as to take a bite, the realisation has been a rude shock to the palate, due to the acrid astringent flavor imparted, and it is the object of the pickling process to remove this objectionable property.

The bulk of commercial olives such as one buys from the grocer, are pickled in the green stage, and as they are got up in glass vessels with attractive labels, look very fine. It is the less known ripe fruit, however, which forms the more readily digestible article as well as the most nutritious, owing to the greater oil development. In either case the same utensils are required, the principal one being a glazed earthenware or wood vessel, preferably with a moderate sized opening and of a suitable capacity. A tin of caustic potash, of 98 per cent. strength, such as may be obtained from any store, a supply of salt, and good water complete the outfit.

GREEN FRUIT.

The olives should be full grown and picked just before they begin to turn color. Gather carefully and grade out all small or injured fruits. Place in the pickling vessel, and if possible fill up to the mouth. To each gallon of liquid necessary to fill the vessel add 1½ozs. of the caustic potash. Completely fill and allow to stand for four days, keeping the olives submerged the whole time.

After four days draw off the potash solution and replace immediately with a salt solution or brine made by dissolving 2ozs. of salt to each gallon of fresh water. Allow this to remain two days, and then replace with brine, using 4ozs. salt per gallon. After four days replace with brine, 6ozs. per gallon. Repeat in four days with brine, 8ozs. per gallon. Finally after five days at this strength, replace with a brine of 12ozs. salt per gallon, and allow to stand three weeks. Keep the fruit submerged, and if signs of mould appear change the brine.

After a period of three weeks has elapsed the fruit may be bottled for convenience of keeping. Make a brine with from 12-16ozs. salt per gallon and boil well. Place the fruit in bottles, jars, or other vessels as may be expedient, and pour on the brine at about 80 degrees C. or 176 degrees F. Roughly this may be taken as just off the boil, and in fact boiling water will do the fruit no harm. The olives are shortly ready for use, but improve on keeping say from three to six months before using. Sterilised in proper jars they keep indefinitely.

RIPE FRUIT.

The greatest difficulty experienced in pickling ripe olives is that they tend to go soft, and it is found that the first or " lye " solution if composed of part potash and part salt will help to prevent this defect. Only sound ripe fruit should be used, and the larger the better.

Make a solution of 1½ozs. caustic potash and 3ozs. salt to each gallon of water, and allow the olives to remain in this from one to two days. Next rinse and stand in clean water for some four hours, and then place in brine made with 3ozs. of salt per gallon for one day. Gradually increase the strength of brine, as in the case of green fruit, finally bottling in the same manner.

In both processes care must be taken to prevent the formation of mould on the surface, but provided the treatment is carried out carefully there is little danger of this arising.

Bottling with a brine of 12-16ozs. salt to the gallon gives a finished article highly charged with salt—too much so for most palates—and to reduce this the following plan may be recommended. A day or so before use pour out the brine from a jar and fill up with hot water. This reduces the percentage of salt in the fruit, and it may be reduced still further to suit the palate of the consumer.

In the treatment of green fruit one of the main difficulties to contend with is discoloration of the skin by oxidation processes. Not only does this occur in the fruit exposed on the surface, but also to a certain extent to the whole by reason of air dissolved in the water. A plan to overcome this is to boil all solutions and allow these to cool before use. The result is a much more evenly colored and attractive pickle. It is more trouble to carry out, but is worth the extra bother when results are compared.

Now a final word as to bottling. If the olives are to be kept any considerable length of time, they should be sterile to prevent the growth of moulds, and for most purposes good hot brine is sufficient, provided the bottles are airtight. The best result obtained by the writer was to bottle the fruit in Mason one pint jars with rubber rings, and fill up with fresh water. These bottles were then placed in a preserving pan and immersed in water which was heated until the water in the jars was boiling. The jars were then screwed down while hot. The fruit kept in excellent condition, being firm, with a fine nutty flavor

INTER-STATE FRUIT EXHIBITION, HOBART.

SOUTH AUSTRALIAN SUCCESSES.

MEETING OF POMOLOGICAL COMMITTEE.

By GEO. QUINN, Horticultural Instructor.

Mr. Geo. Quinn, Horticultural Instructor, who, with Messrs. G. Laffer, M.P., and H. Wicks, representing the South Australian Fruitgrowers' and Market Gardeners' Association, attended the recent Interstate Fruit Exhibition and meeting of the Pomological Committee at Hobart, has submitted a report to the Director of Agriculture (Mr. Wm. Lowrie, M.A., B.Sc.). After acknowledging the great assistance rendered him by Messrs. Laffer and Wicks, both in connection with this State's display at the show and the meetings of the committee, Mr. Quinn proceeds :—

THE EXHIBITION.

The exhibition was organised by the Tasmanian Fruitgrowers' Association and its success was largely attributable to the energetic action of the President of that body, Mr. L. M. Shoobridge. It was claimed to be the finest display of apples yet brought together in Australia. The show, which was opened to the public on May 6th, 7th, and 8th, was held in a large wool store lent by Messrs. A. G. Webster & Son, and, as it possesses an unbroken floor space of upwards of one acre in extent, the magnitude of the display can be pretty well imagined. The prize schedule comprised 60 sections, for which prize-money to the extent of £400 was offered. Most of the classes were confined to Tasmanian-grown fruits. In the open collections the exhibit entered by the South Australian Horticultural Branch was the only instance of a State department competing. The Victorian Department of Agriculture sent collections of apples and pears, which were not entered for competition, whilst the New South Wales and Queensland departments only forwarded such fruits whose identity was in doubt, and on which the opinions of the Nomenclature Committee were sought.

There were good entries in almost every line, and consequently the competition was keen. The outstanding feature of the show was undoubtedly the cased fruit, most of which was displayed unwrapped, the hundreds of cases displayed in the various sections making a fine spectacle. A big percentage of this fruit would have been hard to beat in any part of the world, as it obviously had been selected with great care and marked regard for evenness of size, shape, and color. In this section the varieties which could be exhibited were specifically stipulated, with the result that the artistic efforts of some of the exhibitors produced particularly fine color effects.

METHODS OF PACKING.

Of noteworthy interest in the sections for cased fruit was the almost general abandonment of what is known as the square or straight pack, which is generally adopted by South Australian packers, in favor of the numerical or diagonal packs universally practised by the American apple growers who put their fruit up in cases. This alteration doubtlessly can be largely attributed to the demonstrations given by Mr. A. Sampson, of Oregon, U.S.A., whose services were secured by the Tasmanian Department of Agriculture for a month in two successive seasons for the purpose of giving lessons in the fruit-packing sheds of the State. It is to be regretted that South Australia missed the opportunity of securing the services of this expert packer. There is no doubt in my mind that the diagonal system will prove to be of considerable benefit to those engaged in the apple-exporting business, because it ensures more even grades and better carrying powers to the fruit ; in fact, to successfully pack by this system accurate grading becomes essential, and the Tasmanians consequently have resorted extensively to the use of mechanical grading machines, several of which I took the opportunity of closely inspecting at work, both at the exhibition and in private packing-sheds in the orchard districts. Those which attracted my attention most were the "Lomas" grader and the "Shields" grader, the former sorting its fruit through the medium of a perforated leather belt working on an inclined plane. The Shields consisted of an inclined surface, down which the fruit is passed between sloping longitudinal rollers—which are fixed in a gradually-widening position as they descend—their revolving movements causing the fruit to roll and turn as it passes down the slope, and thus dropping through the holes as soon as space between the rollers is sufficiently wide. By means of these graders the fruit is divided into sizes of no greater difference than ⅛in. or ¼in. in diameter, and, where properly padded on the outlets, bruising seemed to be practically avoided. These machines cost from £30 to £35, and are in general use throughout the larger orchards of the State. The manager for Peacock & Co., on the Huon River, informed me that he had graded upwards of 30,000 cases during the past season, and no apparent injury was known. Owing to the period over which the packing operations extend there would appear to be some difficulty about properly utilising the machines in the small packing centres, but wherever district packing sheds are formed I am confident that some similar mechanical grader must necessarily be adopted here if we are to maintain our position in the competition with other apple-exporting States.

SOUTH AUSTRALIAN SUCCESSES.

In respect to the position taken by our South Australian collections of apples and pears, I am pleased to report that the first prizes were granted to them in the competitive sections. The collection of pears consisted of 78 varieties, and, on the whole, the quality was unapproached. In the apple collection the South Australian exhibit was placed third in the initial decisions of the judges, but as this was so palpably incorrect, viewed in the terms set out in the section of the schedule, I, at the request of my colleagues, Messrs. Laffer and Wicks, lodged a protest, which the committee upheld, and appointed the President and Mr. James Lang, of Harcourt, Victoria, to review the decisions. These gentlemen, after a very protracted scrutiny, reversed the positions, placing the South Australian fruit first. It was in consequence of this dispute that I took the liberty of seeking the Hon. Minister's permission to donate the prize money awarded for the collection of apples to the local charities in Hobart, and on receipt of a wire conferring the Hon. Minister's permission I wrote the President of the Show, intimating the Minister's wish to give, not only the prize money, but the whole of the fruit sent by our State, to the local charities.

The collection of apples we staged consisted of 270 varieties, most of which were drawn from the collection growing in the Typical Orchard at Mylor, though Messrs. Wicks (of Balhannah), Woodlands (of Wirrabara), and Collins (of Summertown), generously contributed some excellent samples. Amongst the pears, the fruit contributed by Messrs. Wicks, Laffer, and Robin helped most materially the remainder, which also originated from the collection gathered together by the Director of Botanic Gardens at Mylor.

CARRIAGE OF FRUIT.

In regard to the method of transporting the fruit for exhibition purposes, more particularly where, as was the case in this instance, it is subjected to many handlings after having been held in cool store for some weeks, we had in this experience a striking illustration of the advantages possessed by the tray system over the ordinary export or dump case. Our consignment consisted of over 30 crates, made up of three trays cleated together at the ends, and seven or eight export cases. In the former it was quite the exception to find a damaged fruit, but in the export cases—some of which were made of pine and others of hardwood—many of the apples were badly bruised and damaged thereby. The fruit from the Mylor orchard was selected by and packed under the supervision of Mr. Savage, the orchardist at the Blackwood Experiment Orchard, and the care exercised by him contributed in no small degree to the results achieved.

MEETING OF POMOLOGICAL COMMITTEE.

This committee was composed of representatives of the Departments of Agriculture and the Fruitgrowers' Associations of all of the States excepting Western Australia. The sittings were held simultaneously with the progress of the show, and in a room adjoining it, so that the scrutiny of the fruits in any of the collections was facilitated. The principal work of the committee at this meeting consisted of the verification of the identity of a great many of the varieties of apples and pears commonly grown in each of the States. The sample dishes on exhibition were minutely compared, and in some instances it was found that totally distinct fruits were being grown under identically the same name in different States of the Commonwealth, and even in different parts of one State. Although I took a minute record of all the resolutions arrived at in regard to these matters, it is not proposed at this juncture to trench on the official report, which will be issued shortly, and placed before the different State authorities. In regard to this matter of uniform nomenclature there is, besides the verification of the identity of varieties which have been fully described by pomological authorities in other parts of the world, a number of Australian seedlings of which no standard description exists; and it was decided in reference to these that the Government Horticulturist in each State should, after minute dissection of typical samples, compile a description of the seedlings deemed of value which have originated in his State, and that these descriptions be submitted for verification at the next meeting of the committee, which it is proposed should take place in Adelaide next year. This, doubtless, is a step in the right direction towards securing uniformity, and establishing the identity and origin of Australian varieties; but it will be only half fulfilling its object unless it be possible to supplement the written description with sectional and colored illustrations, as well as durable and properly-colored models. As this appears to me to be a matter of national interest, I would respectfully suggest for the Hon. Minister's consideration the advisableness of each State department placing a small amount annually on its Estimates, say £20, for the purpose of furthering this idea. Without some such permanent record of the deliberations and decisions of the committee can be established the value attachable thereto will be largely lost to the fruitgrowing community.

TASMANIAN FRUIT CULTURE.

Advantage was taken of the opportunity to visit orchard country along the Huon and Derwent Rivers in the south, and along the Tamar River in the north of the island, and much evidence of progress was noticeable during the period which had elapsed since a previous visit paid some years ago. Although the main bulk of Tasmania's apple production still consists of Sturmer Pippin, Scarlet Nonpareil, Cleopatra, and French Crab, new varieties are gradually creeping in; principal amongst these are the Delicious, and Stayman Winesap, of American origin, and Crofton Pearmain, a locally-raised Tasmanian apple. These are all highly-colored apples of valuable qualities, and the two last-named appealed to me as being worthy of consideration from our planters in this State.

FRUIT CASES.

I was particularly struck with the cheapness of the Tasmanian cases of the better type, which are made from the stringybark timber growing in the vicinity of most of the orchards. I was assured by growers in the Huon Valley that the best case cost them 6½d., as against 10¾d. to 1s. paid by our growers for pinewood cases possessing little or no superiority over these better types of Tasmanian cases. The timber available for case-making in Tasmania is undoubtedly superior to anything indigenous now growing in this State. This difference in the cost enables the Huon apple grower to purchase his case, pack it, and pay 2½d. required for the water carriage to the ocean steamer at Hobart, at no greater cost than the bare cost of the case in South Australia. I am assured that this timber, if cut to sizes for box-making, and carefully stacked for some months before being used, lends itself to making an excellent package, and it would be, in my opinion, worth while our local fruitgrowers attempting to secure a trial shipment.

I took the opportunity of inspecting drying plants, and sampling the products of the Tasmanian Cider Company's operations, where a most excellent sparkling cider is being produced under the managership of an ex-South Australian, Mr. Foureur, formerly of Mitcham, in this State. These efforts to utilise the rejects from the packing sheds are undoubtedly proving a boon to the fruitgrowers, and there is no reason why our own State should lag behind in these respects. In the valley of the Tamar much substantial progress has been made in the planting of apple and pear orchards, and the results so far are extremely encouraging; so much so that they offer much support to the belief of the residents of the North that they are likely to seriously challenge the South in the extent of their fruitgrowing. The Marine Board at Launceston have undertaken to accommodate deep-sea vessels a few miles below that town. This will facilitate the handling of the fruit and encourage the extensions of the orchards.

POULTRY NOTES.

By D. F. LAURIE, Poultry Expert and Lecturer.

YOUNG STOCK.

All utility poultry breeders are now hatching and rearing chickens. The future of the fowl, for whatever purpose it is bred, depends upon the early treatment meted out. There are various modes of treating young chickens, both in regard to brooding and also as to feeding, and the kinds of food used. The objects of feeding are many; the first and main object is to supply warmth. Food values are often considered in the light of heat producers; the accepted rule is to calculate food values on their heat production—combustion. The processes of life may be likened to combustion. But if you provide merely sufficient food to supply the necessary animal warmth and no more, there will be stagnation, and stunted chickens. You must go farther and supply sufficient to repair losses due to the action of living, and, naturally, you must provide food which will promote growth—*i.e.*, increase of the tissues. More than this is required; for you must enable the bird to build up a reserve. Eggs can only result when a pullet has been so fed that she has stored up reserves from which egg-forming materials can be elaborated. Birds intended for egg and stock production need special treatment, and in the matter of food there should be a difference in the treatment of chickens intended for early market.

KINDS OF FOOD.

In this State many poultry keepers do not recognise that variety in food for all stock, and poultry in particular, is highly advisable and necessary. Not any one grain, nor even a combination of grains and seeds is a perfect food, because all the constituents necessary for the welfare of the bird are not contained therein. A general combination of grains and their by-products, with plenty of vegetable food and a due proportion of animal food is what is required, and within the reach of every breeder. The value of change is well known to careful stockmen, and the recognition of properly nutritious feeding has led to the crude generalisation "Half the breeding goes in at the mouth." We grow, and breeders can obtain, wheat, oats, barley, rye, and peas, and at times maize is obtainable and can be well used, because the small quantity required does not materially add to the average cost per hen, and yet is very satisfactory. The ordinary mill products of wheat—bran and pollard—can be obtained anywhere, and in the South-East oat bran and pollard are to be had. Every breeder, farmer, or otherwise, should grow green food. Animal food—rabbits, plucks, livers, &c.—and meat meal are also obtainable. Space does not admit of a general dissertation on the feeding value of different grains, vegetation, &c. I have dealt with that elsewhere. Wheat is a good staple grain, but in cold weather feed also stout oats, a few peas, and a little maize. Rye need only be used when there is surplus on the farm. Barley is serviceable for growing and fattening table poultry. Bran and pollard fed as mash, wet or dry, are not absolutely essential, but the results when these are intelligently used are most satisfactory. Where wet mash is fed meat meal, &c., can be most conveniently and economically combined. Green and cured vegetable foods are of the utmost importance, because they contain the valuable mineral salts which are lacking in grain and mill products. Moreover, green food should be cheap, and as a large amount may and should be fed, the food bill can be very materially reduced.

Chickens are better managed when fed for the first month on cracked grain mixtures, after that period they may have a little mash daily. Hulled oats, flaked oats, and coarse oatmeal look expensive, but the actual cost per bird is so little that it is the best policy to use these ; also canary, millet, and hemp, in addition to cracked wheat, oats, and maize, so as to give the chick a good start. Dry mash is favored in many parts of the world, and growing stock, especially chickens for sale as market birds, are greatly benefited if a little hopper of dry mash is provided. The dry mash may consist of ground wheat, oats, barley, adding a little peas and maize, and finally 5 per cent. of meat meal and the same amount of screened charcoal grit. Keep hoppers of sharp sand and grits of all kinds. See that fresh clean water is always at hand.

SEPARATE THE SEXES.

Autumn-hatched chickens make good growth, and they do better if the sexes are separated as soon as the cockerels begin to make themselves prominent. This point is not always observed.

MARKET EARLY.

Feed well and get your chickens to market as soon as possible. If properly fed they will always be plump, and you can send them in as soon as they reach 3lbs. If plump, this is a satisfactory weight for our market. Larger birds are not always so profitable. The prices have been excellent, and will continue so. Good chickens are now becoming scarce, and this will be the case for many months. Fattening properly is of vital importance. Very few really well fed fowls are obtainable in Adelaide markets. The usual flaky mash fed to fowls for egg production is not sufficient; you require less bran and should add ground oats, maize, and a little peas.

PULLETS NOT LAYING.

In many cases where pullets have not been laying well the trouble has been due to shifting them from pen to pen, and thus throwing the birds into a moult. Wherever possible the young pullets should have a big run to develop them, and then, before they show signs of laying, should be drafted into permanent quarters and not disturbed. It is both annoying and unprofitable to find flocks of pullets moulting when eggs are at their highest price.

TABLE POULTRY.

Those who are undecided should obtain specimens of the all-round or general purpose breeds, and produce market chickens. The high price of butchers' meat, we are informed, is likely to prevail in the future. This is the breeders' opportunity; breed and sell at the excellent prices obtainable. In breeding for table you have a quick crop, and when you sell the last, in February or March, you have time to clean up and do many things that cannot be done while the yards are stocked. There is a big and growing demand for chickens and ducklings, and prices are high and profits good.

PROPER HOUSES AND YARDS.

Many breeders have not yet recognised that proper houses and yards are essential to success. Design is everything. The covering material should be iron. The framework can be put up much cheaper than is thought. It is satisfactory to note that during the last few months hundreds of applications for advice on this matter have been received. Letters are always welcomed and answered promptly. Occasionally a letter is received in which the writer asks me to tell him "everything" about poultry—breeding, housing, feeding, diseases, marketing, &c. This is unreasonable, and is not practicable. It is advised that all who contemplate breeding should first obtain from the Government Printer, Adelaide, a copy of my Poultry Manual (7d. posted). They should also subscribe to this *Journal*; it is only 1s. a year posted. Then if they write for definite information, and say what capital they have to invest, and a few details of locality, land, &c., much time can be saved.

FARMERS TAKE NOTE.

I have heard many harrowing accounts of those who have taken up farming and through bad seasons have met disaster. I would say decidedly there is no part of the State where farming is possible which is not also suited to poultry culture. I say definitely that if each beginner on the land had regarded as essential a good flock of poultry of the right sort, and with adequate accommodation, there would have been returns sufficient to have fed and clothed him and perhaps his family, and so enabled him to tide over bad seasons. Hundreds lived upon their poultry products in days gone by, when the market for eggs and table birds was about half what is now obtainable. Information as to requirements can always be obtained on application.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1914-15.

[Started April 1st, 1914, to terminate March 31st, 1915.]

Competitor.	Eggs Laid for Month ended May 31st.	Total Eggs Laid from April 1st, 1914, to May 31st, 1914.
SECTION I.—ANY BREED.—TEN PULLETS EACH PEN.		
WHITE LEGHORNS.		
Hay, C., Prospect	55	124
Indra Poultry Farm, Freeling	159	283
Moritz Bros., Kalangadoo	131	245
Sargenfri Poultry Yards, East Payneham	99	154
Albion Poultry Yards, Magill	136	160
Conyers, H., Morphettville Park	158	268
Brackley Poultry Yards, Hectorville	139	185
Schäfer, N. H., Strathalbyn	56	104
Mason, A. E., Langhorne's Creek	121	222
Robertson, D. J., Hamley Bridge	182	358
Olive Poultry Farm, Freeling	94	223
Bradley & McDonald, Moorabbin, Victoria	161	298
Sunny Brae Poultry Farm, Islington	79	162
Winter & Creswell, Port Pirie	102	202
Kelvin Poultry Farm, Kelvin Grove, Brisbane	93	153
Abby Poultry Yards, Willaston	126	200
Broderick Bros., Gawler	161	271
Gill, J. H., Cheltenham, Victoria	115	241
Dunn, C. C., Cheltenham, Victoria	162	224
Evans, H. A., Richmond, South Australia	100	178
Ellimatta Poultry Yards, Torrensville	76	147
Pettigrove, T. A., Northcote, Victoria	91	226
Rice, J. E., Cottonville	111	205
Purvis, W., Glanville	199	342
South Yan Yean Poultry Farm, Doreen, Victoria	112	170
Purvis, W., Glanville	160	321
Pope, R. W., Heidelberg, Victoria	197	365
Provis & Son, Tumby Bay	145	184
Tockington Park Poultry Farm, Grange	84	166
Woodhead, H., Torrensville	173	330
Pimlott, A. V., Port Pirie South	82	153
Excelsior Poultry Farm, Willunga	14	27
Barron, Tom, Catforth, England	181	370
Ogilvie, G. L., Hamley Bridge	—	43
Ford Bros., Kensington Gardens	89	206
Hughes, J. A., Willunga	73	122
Broster, G., Mallala	87	195
Roberts, C. A., Kersbrook	114	144
Campbell, J. D., Barabba	126	191
Rowe, J., Long Plain	124	220
Messenger & Roberts, Albert Park	77	157
Harris, J. G., Black Forest	114	222
BLACK ORPINGTONS.		
Fisher, D., Drouin South, Victoria	117	256
WHITE WYANDOTTES.		
Barron, Tom, Catforth, England	193	344

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Score to May 31st. Bird No. 1.	2.	3.	4.	5.	6.
SECTION III.—SINGLE TESTING.—LIGHT BREEDS.—SIX PULLETS EACH PEN.						
White Leghorns.						
Hay, C., Prospect	39	21	8	5	11	22
Harris, J. G., Black Forest	17	31	10	—	—	—
Glenelg River Poultry Farm, Mount Gambier	23	11	31	38	23	21
Schafer, N. H., Strathalbyn	—	17	—	—	—	1
Eckermann, W. P., Eudunda	25	17	7	9	30	17
Hagger, J. C., Orroroo	—	27	15	18	4	—
Glenelg River Poultry Farm, Mount Gambier	3	23	19	6	—	19
Koonoowarra, Enfield	21	16	18	1	26	10
Moritz Bros., Kalangadoo	26	26	32	26	23	16
Sargenfri Poultry Yards, East Payneham	4	—	1	1	24	10
Albion Poultry Yards, Magill	20	15	8	7	22	21
Glenelg River Poultry Farm, Mount Gambier	19	—	18	14	9	32
Conyers, H., Morphettville Park	13	31	26	22	36	8
Beadnall Bros., Gawler	17	22	14	25	15	39
Schafer, N. H., Strathalbyn	13	20	3	19	1	9
Robertson, D. J., Hamley Bridge	15	27	21	35	20	26
Russell, E. L., Salisbury	27	19	22	20	1	13
Bennett & Furze, Wright Street, City	—	9	17	—	1	—
Flannigan, J., Maylands	14	9	24	24	2	14
Miels, C. & H., Littlehampton	15	31	—	33	26	—
Sunny Brae Poultry Farm, Islington	31	16	14	28	12	24
Dunn, L. F., Keswick	39	10	35	10	10	20
Electricum Poultry Yards, Glenelg	34	33	27	22	19	10
Barkla, L. W., Gawler South	8	10	12	15	22	—
Purvis, W., Glanville	24	25	18	39	33	22
Harvey, A., Hamley Bridge	29	28	17	15	21	12
Brock, A. G., Hamley Bridge	—	23	—	9	21	31
Leonard, W. J., Port Pirie	—	1	—	10	12	—
Bertelsmeier, C. B., Clare	20	16	27	31	16	22
Messenger, A. J., Alberton	17	10	2	4	17	8
Bond, A. J., Clare	22	30	9	18	29	27
SECTION IV.—SINGLE TESTING.—GENERAL PURPOSE BREEDS.—SIX PULLETS EACH PEN.						
White Orpingtons.						
Koonoowarra, Enfield	10	18	11	8	22	—
Hocart, F. W., Clarence Park	—	—	—	—	—	—
Dawkins, W., Wayville	—	—	2	—	12	—
Perkins, C. W., Kensington Park	9	—	—	—	—	13
Black Orpingtons.						
Padman, J. E., Plympton	—	—	1	—	22	14
Kappler Bros., Marion	31	12	—	8	—	—
Haggar, J. C., Orroroo	—	16	—	—	—	—
Pope Bros. & Co., Hectorville	—	—	—	—	—	—
Greaves, W. E., Prospect	3	—	—	8	—	7
Pearson, W. S., Kingswood	2	—	—	—	3	2
Buff Orpingtons.						
Bennett, C. E., North Unley	—	—	—	4	—	—

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Score to May 31st. Bird No. 1.	2.	3.	4.	5.	6.
SECTION IV.—*Continued.*						
SILVER WYANDOTTES.						
Howie, T. B., Edwardstown	14	—	—	—	12	27
Kappler Bros., Marion	—	—	—	—	7	15
Dunn, L. F., Keswick	4	36	1	—	—	11
Perkins, C. W., Kensington Park	—	—	—	—	—	—
WHITE WYANDOTTES.						
Albion Poultry Yards, Magill	—	—	—	—	—	—
Gibson, F., Stepney	—	—	—	—	—	—
WHITE ROCKS.						
Padman, J. E., Plympton	—	—	11	1	—	22
Alberta Poultry Yards, Franklin	—	—	—	—	—	—
Koonoowarra, Enfield	—	25	—	—	—	—
PLYMOUTH ROCKS.						
Hagger, J. C., Orroroo	—	—	—	2	15	—
Greaves, W. E., Prospect	—	—	12	—	—	—
LANGSHANS.						
Palmer, W., Goodwood Park	—		—	—	12	—
INDIAN GAME.						
Coleman, C. B., Alberton	—	—	—	—	—	—
RHODE ISLAND REDS.						
Koonoowarra, Enfield	—	—	—	—	—	—

D. F. LAURIE, Poultry Expert and Lecturer

PARAFIELD EGG-LAYING COMPETITION.

REPORT FOR MAY.

The general moult which is affecting the majority of the birds is resulting in a low egg yield. Last year the birds were enclosed during the cold weather in comfortable, roomy scratching sheds. The cold weather records were excellent. The feeding is as usual. No undue stimulants are used at Parafield, as is apparently the case elsewhere. Animal food in moderation only is the rule. To give each hen daily an ounce of boiled liver is the adoption of forcing methods which must seriously affect the constitution of the birds which will probably be used as breeders next year; besides the use of such quantities of animal feed is expensive, and not practical from the general breeder's standpoint. Doubtless the abnormal season has affected the laying competition fowls, as well as in numerous other cases. As the season advances no doubt egg production will improve.

Health.—The general health of the birds has been good. Two have been in poor condition, three were pecked by other birds in their respective pens, one has been treated for diphtheria, one for roup, and one for a blackened comb. Four of these have now been returned to their right pens.

Moult.—The moult, which is of a very protracted nature this season, is still the cause of either a very low score in some pens, or of none at all in others. The moult has played havoc with the laying among all fowls of various ages this season, and in many cases is likely to do so for some time.

Green Feed.—Green feed is luxuriant in its growth, owing to seasonable rain and genial sunshine. The birds get an abundance of lucerne, and will shortly get a liberal supply of green barley.

Broodiness has made its usual early appearance among the competition birds. Cases have been recorded from both pens of heavy breeds in the open section.

Visitors.—Forty-five visitors have inspected the station during the month. It is surprising the number who mistake the Saturday visiting day, as many think it is the last Saturday in the month, whereas it is the fourth. Others again think it is the fourth Wednesday. However, a total of 1,098 have inspected the station to date.

Weather.—The weather has been mild. On two mornings only frost was recorded. There were some very nice warm days during the month, and the birds have kept going.

Rainfall.—Rain fell on eight days, with a total of precipitation of 149 points.

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ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, May 13th. The Vice-Chairman (Mr. F. Coleman) presided, and there were also present Professor Perkins, Col. Rowell, Messrs. A. M. Dawkins, T. H. Williams, C. J. Tuckwell, J. Miller, and G. G. Nicholls (Secretary).

Saline Water for Stock.—The Secretary intimated that arrangements had been made in connection with the testing of saline stock water by the chemist at Roseworthy College, for samples of water to be forwarded at regular intervals from Salt Creek (running into the North Para), Coorabie (far West Coast), Appila-Yarrowie, and Monarto South.

Gratwick's "Beats-all Fertiliser."—In reply to the Board's request for a report on this subject, the Minister of Agriculture wrote—"The Government is unable to experiment with proprietary compounds." The Chairman regretted that apparently it was not possible to have the stuff properly tested. The purpose of the Fertiliser Act, he pointed out, was to protect the users, and ensure them receiving exactly what they paid for. The question was—were the people in this particular instance getting what they wanted. He felt that it was highly desirable, in the interests of the farming community, that an official report on the compound should be obtained and circulated. Professor Perkins suggested that if the position were placed before the Minister in that light he might be prepared to instruct the Inspector of Fertilisers to go into the question, and furnish the information desired. Ultimately it was resolved that the Chairman should personally interview the Minister.

Combined Implement.—A letter from the Willowie Branch requested that the Government should bs approached with a view to induce it to encourage the manufacturing of a compound cultivator and seed drill by offering prizes at the Royal Agricultural Society's show, or by other means. The opinion was advanced that under present conditions such an implement would prove to be very convenient and labor saving. Professor Perkins said that the more people were encouraged to use labor on the farm the better. In regard to this matter the use of separate implements would be preferable to the employment of only one because of the double stirring of the ground. Mr. Dawkins held that the combination implements of the kind indicated were inclined to bury the seed too deeply. It was desirable that the cultivator should precede the drill. At the instance of Col. Rowell it was decided to send the communication without comment to the Agricultural Committee of the Royal Agricultural Society for an expression of its views respecting the wisdom or otherwise of adopting the course suggested.

Feeding Value of Maize.—A letter from the Longwood Branch stated that a member who had perused the published results of experiments undertaken with a view to ascertain the feeding value of hay cut at different stages, wished to know whether particulars of the feeding value of maize cut at different stages could be supplied. Professor Perkins said experiments to that end would take a long time. Investigations had already been made in other parts of the world, and it had been found that maize cut green showed the highest feeding value when the cobs were in the milky stage. Except where it was properly irrigated, however, it seldom reached that stage in South Australia. Professor Perkins, at the request of the Board, undertook to write his comments for the benefit of the Branch.

Lectures on Forestry.—Mr. Dawkins asked whether it would be possible to make arrangements for Mr. Corbin (Lecturer in Forestry) to give addresses before the different Branches of the Bureau. If they could be, he submitted, the lectures would undoubtedly do a lot of good. The State was constantly distributing young trees among the farmers, and these were planted in all sorts of ways. Through improper treatment many of them were annually sacrificed. He moved that the Minister of Agriculture should be approached on the matter, and this was agreed to.

Prizes for Sows.—The Chairman reported that the Royal Agricultural and Horticultural Society had agreed to include first, second, and third prizes for young sows at the next livestock show.

Spontaneous Combustion of Oily Rag.—Mr. Tuckwell uttered a warning in respect to the danger of leaving oily rags where damage could be caused by fire. He said—"Recently we had the front of our premises at Willowie rubbed down with linseed oil, and afterwards the rags were thrown in a heap in the gas generator house. Some hours later we found that they had ignited spontaneously, and when discovered the fire was rapidly spreading. At first we could not believe that it was a case of spontaneous combustion, but an experiment demonstrated conclusively that that was the explanation of the outbreak. To make assurance doubly sure we wrote to the Superintendent of the Metropolitan Fire Brigade, and his reply was absolutely confirmatory."

New Branches and Members.—Approval was given to the formation of new Branches as follows :—Halidon—Messrs. M. O. Weste, W. F. D. Clarke, J. M. Braithwaite, D. C. Chambers, C. H. Coventry, J. C. Gallasch, E. Grace, H. T. Harris, J. A. Hehir, J. L. Opie, L. Rosser, D. Thomson, L. A. von Doussa, D. Westover. Mount Compass—Messrs. A. J. Hancock, W. Cocks, R. Peters, F. E. Slater, M. Wherman, C. C. Kieswetter, G. H. Waye, J. Norman, C. Skews, E. A. Jacobs, T. Trevena, D. J. Hutton, A. Perry, O. Wherman. Albert—Messrs. J. Lee, C. A. Evans, J. T. Colbert, W. H. Cope, A. B. C. Dohse, C. W. Cope, A. Dohse, R. Copp, M. J. Walsh, H. S. Cope, J. Lambert, R. Manning, H. F. Beckman.

New Members.—The following gentlemen were approved as members of the Branches shown :—Berri—W. C. Stidiford ; Morgan—G. Hoffman ; Quorn, G. D. Watt ; Strathalbyn—C. Verco ; Monarto South—R. Hein ; Crystal Brook—W. J. Deer, J. L. Washington, H. H. Nicholls ; Wilkawatt—G. Oram ; Maitland—A. Oakley, W. Quallmann, G. Gapp ; Roberts and Verran—W. E. Bowers, H. J. Crutchett ; Mitchell—W. Dorward ; Bute—H. N. Paterson ; Lameroo—F. Bull ; Borrika—D. J. Leadbeater ; Hartley—W. Jaensch ; Mitchell—W. J. Trimble, R. J. Tehan, T. Bishop ; Claypan Bore—G. R. Small, G. W. Small ; Mount Barker—R. G. Birt ; Glencoe—H. E. McRostie ; Mundoora—S. Carman, H. H. Stephenson, F. W. Button ; Naracoorte—J. A. Kluge, A. B. Feuerheerdt ; North Bundaleer—A. Pitt, J. Pollard, E. O'Halloran, D. J. Shepherd ; Yorketown—F. Emmell ; Port Germein—W. Nevin ; Carrieton—W. G. Brown ; Parilla—P. B. Clegg, A. J. Wilson, W. J. Mitchell, A. Carmen ; Clarendon—W. Biddle ; Leighton—W. Lloyd ; Morphett Vale—C. Renihan ; Monteith—R. M. South, J. L. McAuliffe ; Belalie North—W. R. Bradtke ; Woodside—J. Lauterbach, J. Caldwell ; Mount Bryan—S. Robinson, W. H. Quinn ; Coomooroo—L. G. D. Palmer ; Gladstone—E. P. Rowe ; Meadows—W. L. Schroeder ; Kalangadoo—A. P. Gardiner, E. V. Barlow ; Strathalbyn—J. F. Dodd, G. Tucker, A. Tucker, H. Meyers ; Riverton—W. S. Kelly, H. C. Thomas, A. Bailey, W. Knaeurhase, W. R. Fisher ; Saddleworth—J. M. Fraser, E. Stilling.

Shipping Wheat.

AGRICULTURAL STATISTICS.

RESULTS FOR SEASON 1913-14.

WHEAT PRODUCTION, 16,936,988 BUSHELS; AVERAGE, 7·47 BUSHELS.

The Government Statist (Mr. L. H. Sholl, C.M.G.) has issued the final results of the last harvest of cereal, hay, and fodder crops. The year 1913 was an exceptionally dry one, the rainfall being even lower than in the previous two dry years, 1911 and 1912. In view of this fact the returns of the harvest which were compiled by the Assistant Government Statist (Mr. W. L. Johnston) must be taken as affording indisputable evidence of the improvement in the practice of agriculture generally in the State. The total yield of wheat was 16,936,988bush. off 2,267,851 acres, or an average of 7·47bush., which, considering that the crops sown for grain on at least 190,000 acres were an absolute failure, and the low average in some divisions of the State, must be considered very satisfactory. The yield of hay was 571,616 tons, a decrease of 143,150 tons on the return of the previous year. One significant feature disclosed by the statistics is the large increase in barley production, the yield of 1,332,714 bushels being 13,980bush. more than the previous best yield, and the acreage sown, 94,039 acres, being 22,170 acres in excess of the area sown to barley last year. The total acreage under all kinds of cereals for grain, hay, fodder, or fed off, was 3,104,366 acres, an increase of 102,643 acres.

Commenting on the season Mr. Johnston states that prospects at the end of August were distinctly unpromising. Except in the Far Northern and Far Western Divisions, however, good rains fell in the greater part of the agricultural areas in September, October, and November, but early in December hot winds prevailed in the wheat districts, and this resulted in a considerable decrease in the anticipated yield.

Below will be found further details taken from the report:—

WEATHER CONDITIONS.

As will be observed from the following details of rainfall for the six months—April to September—only 9·00in. were recorded as the average over the agricultural areas, being 5·83in. below the average for 53 years, and the lowest ever recorded in the history of the State, with the exception of 1902, when only 6·20in. fell for the six months.

Average Monthly Rainfall over Agricultural Areas.

Period.	April.	May.	June.	July.	Aug.	Sept.	Total Six Months.	Oct.	Nov.
	In.	In.	In.	In.	In.	In.	In.	In.	In.
1909	2·68	3·59	3·25	3·61	4·79	1·74	19·66	1·92	1·60
1910	·36	4·06	3·19	4·56	2·18	3·39	17·74	2·30	1·73
1911	·52	2·84	3·01	2·35	1·34	2·49	12·55	·92	·22
1912	·95	·57	2·80	2·83	2·28	3·38	12·83	1·16	1·98
1913	·56	1·05	·55	1·42	2·63	2·79	9·00	2·09	1·17
Mean for 53 years..	1·71	2·57	3·00	2·82	2·57	2·16	14·83	1·80	1·08

Acreage under Cultivation.

(Figures in parentheses are those for the previous season.)

The total acreage under all kinds of cereals for grain, hay, and fodder, or fed off was 3,104,366 (3,001,723) acres, an increase of 102,643 acres. The acreage under wheat and barley shows an increase respectively of 120,072 and 22,170 acres. The area under oats decreased to the extent of 42,802 acres.

All other crops accounted for 36,977 acres, an increase of 3,203 acres. The crops included are maize 1,562 (1,055), rye, 2,660 (2,371), lucerne, 17,554 (16,181), peas and beans, 9,031 (9,308), and other 6,170 (4,859).

The following table shows the distribution of the area in comparison with the previous season:—

Division of State.	Total Area under Cereal Cultivation.	Total area sown for all purposes with—			
		Wheat.	Barley.	Oats.	All other.
	Acres.	Acres.	Acres.	Acres.	Acres.
I. Central	1,016,732	841,439	61,742	96,623	16,928
	(984,392)	(797,726)	(45,049)	(125,601)	(16,016)
II. Lower North	809,946	756,537	5,470	38,220	9,719
	(773,514)	(704,032)	(4,697)	(55,727)	(9,058)
III. Upper North	290,059	287,155	211	974	1,719
	(294,380)	(290,106)	(284)	(2,286)	(1,704)
IV. South-Eastern	429,838	328,704	19,118	73,967	8,049
	(410,585)	(307,924)	(17,896)	(78,430)	(6,335)
V. Western	556,928	485,055	7,428	63,884	561
	(537,679)	(478,802)	(3,913)	(54,340)	(624)
Outside counties	863	742	70	50	1
	(1,173)	(970)	(30)	(136)	(37)
Total 1913-14	3,104,366	2,699,632	94,039	273,718	36,977
Total 1912-13	3,001,723	2,579,560	71,869	316,520	33,774
Increase or Decrease	+102,643	+120,072	+22,170	—42,802	+3,203

Fallow.

The total acreage of land placed in fallow during the season was 1,569,623 (1,537,789) acres, an increase of 31,834 acres. The fallowed area in the Upper North Division shows a big decrease and the area in the Lower North and South-Eastern Divisions a substantial increase, the area in the other divisions being practically the same as the previous year,

PRODUCTION.

In the following summary of the various crops a comparison is made of the total yields and averages with those of the previous season :—

Kind of Crop.	Seasons.				Increase or Decrease.	
	1912-13.		1913-14.			
	Bush.	Avge.	Bush.	Avge.	Bush.	Avge.
CEREALS—						
Wheat	21,496,216	10·34	16,936,988	7·47	—4,559,228	—2·87
Barley (all kinds)	1,318,734	19·12	1,332,714	14·72	+13,980	—4·40
" Malting	1,032,532	19·57	1,070,058	14·96	+37,526	—4·61
" Cape	273,490	18·09	244,279	14·45	—29,211	—3·64
" Other	12,712	11·83	18,377	9·20	+5,665	—2·63
Oats	1,673,508	10·76	1,200,740	10·27	—472,768	—0·49
Rye	10,134	9·87	12,142	9·78	+2,008	—0.09
Peas	127,553	13·70	108,945	12·06	—18,608	—1·64
HAY—	Tons.		Tons.		Tons.	
All kinds	714,766	1·10	571,616	1·01	—143,150	—0·09
Wheaten	556,444	1·13	418,972	1·02	—137,472	—0·11
Oaten	149,195	1·01	143,380	·94	—5,815	—0·07
STRAW—						
All kinds	24,987	—	17,134	—	—7,853	—
Wheaten	10,900	—	13,160	—	+2,260	—

The production of wheat, barley, oats, and hay in the several divisions of the State was as follows :—

Divisions.	Wheat.	Barley (all kinds).	Oats.	Hay (all kinds).
	Bush.	Bush.	Bush.	Tons.
I. Central	5,035,986 (6,161,030)	783,873 (763,041)	414,409 (637,004)	291,435 (355,964)
II. Lower North	6,833,870 (7,836,007)	61,453 (65,922)	135,274 (260,797)	144,006 (191,332)
III. Upper North	1,038,072 (2,035,124)	826 (3,895)	7,618 (27,056)	20,358 (44,009)
IV. South-Eastern	2,011,703 (2,618,292)	405,991 (444,867)	414,449 (480,802)	74,142 (81,458)
V. Western	2,015,357 (2,841,263)	80,101 (40,809)	228,920 (267,149)	41,612 (41,884)
Outside of Counties	2,000 (4,500)	470 (200)	70 (700)	63 (119)
Total 1913-14	16,936,988	1,332,714	1,200,740	571,616
Total 1912-13	21,496,216	1,318,734	1,673,508	714,766
Increase	—	13,980	—	—
or				
Decrease	4,559,228	—	472,768	143,150

Hay.—The cut of hay yielded a tonnage of 571,616 (714,766), a decrease of 143,150 tons. The principal kinds were wheaten, 418,972 (556,444), decrease 137,472, and oaten, 143,380 (149,195), decrease, 5,815. The average was just 1 ton per acre.

Barley.—The yield of 1,332,714bush. of barley shows an increase of 13,980bush. over the previous best yield of 1,318,734bush. in 1912-13. The average of 14·72bush. per acre is the lowest since 1904-5. The South-Eastern division produced 405,991bush., averaging 22·25bush. per acre.

Oats.—This crop shows a decreased yield of 472,768bush., the total being 1,200,740bush., averaging 10·27 (10·76) bushels per acre.

Straw.—The quantity of straw gathered reached a tonnage of 17,134, being 7,853 tons less than the previous season.

Green Fodder and Fed Off.—49,948 (39,806) acres were either fed off or cut for green fodder. At least 20,680 acres of wheat and 5,092 acres of oats were fed off owing to the dryness of the season. The cut for green feed is reported to have been 48,930 tons, of which lucerne yielded 34,279 tons.

Wheat.—On February 3rd last advices were received from every wheat hundred in the State, and on the basis of these a revised forecast was issued, which placed the wheat yield at 16,805,945bush., with an average of 8·18bush. per acre. The final results show the yield to have been 16,936,988bush., averaging 7·47bush. per acre. A much larger acreage was sown than anticipated, but owing to the absolute failure of at least 190,000 acres for grain the average per acre was much reduced. Fully 19,000 acres of the hay area were also an absolute failure. Excluding the failures of the grain area the average yield for the 2,077,570 acres actually reaped was 8·15bush. per acre.

The following tables show particulars of wheat culture in each division of the State for the season 1913-14, contrasted with the mean of the last five seasons:—

ACREAGE UNDER WHEAT FOR GRAIN ONLY.

Season.	Total for State.	Divisions of State.					
		I. Central.	II. Lower North.	III. Upper North.	IV. South-Eastern.	V. Western.	Outside Counties'
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1913-14 ..	2,267,851	627,623	627,757	259,616	303,196	448,959	700
Mean last five seasons ...	2,107,744	609,143	578,816	260,230	260,816	398,205	534
TOTAL WHEAT PRODUCTION.							
	Bush.	Bash.	Bush.	Bush.	Bush.	Bush.	Bush.
1913-14 ..	16,936,988	5,035,986	6,833,870	1,038,072	2,011,703	2,015,357	2,000
Mean last five seasons ...	21,652,903	6,685,510	7,765,053	2,210,438	2,152,100	2,836,972	2,830
AVERAGE YIELD PER ACRE.							
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
1913-14 ..	7·47	8·02	10·89	4·00	6·63	4·49	2·86
Mean last five seasons ...	10·27	10·98	13·42	8·49	8·25	7·12	5·30

In view of the low average rainfall of 17·20in. over the agricultural area of the State for the year 1913 the production of cereals and hay for the season under review is most satisfactory. It should be specially noted that the wheat crop has averaged 21,652,903bush., or 10·27bush. per acre for each of the last five seasons, the Lower North Division alone having averaged each season in the same period 7,765,053bush., or 13·42bush. per acre.

VALUE OF WHEAT CULTIVATION.

To show the importance of the wheat harvest to the State it may be mentioned that the production of grain for each of the last five years has averaged 21,652,903bush., and inclusive of the wheaten hay crop, the mean annual value for the five seasons was £5,296,789, the value of the 1913-14 wheaten grain and hay crop on the average prices to date being £4,190,579.

As intimately associated with wheat culture the fact should be remembered that the capital invested in machinery and implements owned by agriculturists was in 1912 assessed at £2,698,231, and, further, that the prosperous condition of the farming industry is directly reflected in the flourishing condition of many of the secondary industries of the State, notably the agricultural implement and machine works, which for 1912 numbered 57, all employing four or more hands, the total hands being 1,229, who received in wages £124,705, and turned out work to the value of approximately £297,105.

WHEAT FOR GRAIN.

Division and County.	Area.		Produce.		Average Yield per Acre.	
	1912-13.	1913-14.	1912-13.	1913-14.	1912-13.	1913-14.
	Acres.	Acres.	Bush.	Bush.	Bush.	Bush.
I. CENTRAL—						
Adelaide	7,597	7,443	117,526	69,309	15·47	9·31
Albert	73,702	90,181	496,805	374,782	6·74	4·16
Alfred	63,563	74,731	525,043	433,607	8·26	5·80
Carnarvon	704	680	5,561	4,918	7·90	7·23
Eyre	55,559	59,290	445,052	331,924	8·01	5·60
Fergusson	122,193	122,903	1,692,177	1,505,142	13·85	12·25
Gawler	90,250	110,143	1,020,678	726,171	11·31	6·59
Hindmarsh ...	10,522	12,910	113,201	70,823	10·76	5·49
Light	84,317	85,798	1,298,924	1,122,890	15·41	13·09
Sturt	53,287	63,544	446,063	396,420	8·37	6·24
Total	561,694	627,623	6,161,030	5,035,986	10·97	8·02
Increase	—	65,929	—	—	—	—
Decrease	—	—	—	1,125,044	—	2·95
II. LOWER NORTH						
Burra	25,050	28,956	401,493	335,739	16·03	11·59
Daly	204,155	221,435	2,721,343	2,354,765	13·33	10·63
Hamley	200	258	700	700	3·50	2·71
Kimberley	15,352	17,672	131,308	32,660	8·55	1·85
Stanley	183,477	203,782	2,565,653	2,376,616	13·98	11·66
Victoria.......	125,670	146,478	1,980,212	1,709,155	15·76	11·67
Young	6,382	9,176	35,298	24,235	5·53	2·64
Total	560,286	627,757	7,836,007	6,833,870	13·99	10·89
Increase	—	67,471	—	—	—	—
Decrease	—	—	—	1,002,137	—	3·10
III. UPPER NORTH						
Blachford	7,244	7,885	19,670	2,575	2·72	·33
Dalhousie	72,927	84,865	800,137	416,154	10·97	4·90
Derby	—	—	—	—	—	—
Frome	100,360	107,701	940,420	587,424	9·37	5·45
Granville......	11,025	11,278	29,137	741	2·64	·07
Hanson	20,892	18,059	37,931	10,080	1·82	.56
Herbert	8,902	9,113	93,798	4,173	10·54	·46
Lytton	—	—	—	—	—	—
Newcastle	20,413	20,715	114,031	16,925	5·59	·82
Taunton	15	—	—	—	—	—
Total	241,778	259,616	2,035,124	1,038,072	8·42	4·00
Increase	—	17,838	—	—	—	—
Decrease	—	—	—	997,052	—	4·42

WHEAT FOR GRAIN—continued.

Division and County.	Area.		Produce.		Average Yield per Acre.	
	1912-13.	1913-14.	1912-13.	1913-14.	1912-13.	1912-13.
	Acres.	Acres.	Bush.	Bush.	Bush.	Bush.
IV. STH.-EASTERN						
Buccleuch	55,755	63,963	365,780	259,151	6·56	4·05
Buckingham...	31,824	43,255	407,235	498,645	12·80	11·53
Cardwell	5,166	5,292	34,727	35,850	6·72	6·77
Chandos	142,456	143,000	1,429,684	868,654	10·04	6·07
Grey	2,056	2,788	32,315	49,386	15·72	17·71
MacDonnell ...	5,118	6,578	75,660	95,340	14·78	14·49
Robe	5,462	6,856	80,907	96,370	14·81	14·06
Russell	27,506	31,464	191,984	108,307	6·98	3·44
Total	275,343	303,196	2,618,292	2,011,703	9·51	6·63
Increase	—	27,853	—	—	—	—
Decrease	—	—	—	606,589	—	2·88
V. WESTERN—						
Bosanquet	—	—	—	—	—	—
Buxton	110	929	1,002	7,744	9·11	8·34
Dufferin	11,724	14,096	69,276	82,995	5·91	5·89
Flinders	63,405	59,107	517,327	453,671	8·16	7·68
Hopetoun	14,644	18,634	101,562	32,399	6·93	1·74
Jervois	135,039	136,555	782,139	781,136	5·79	5·72
Kintore	27,743	25,085	128,755	40,054	4·64	1·60
Le Hunte	520	887	4,780	3,780	9·19	4·26
Manchester ...	360	4	960	—	2·67	—
Musgrave	25,442	26,496	214,913	128,871	8·45	4·86
Robinson	64,861	67,198	491,752	263,051	7·58	3·91
Way	94,944	99,023	524,926	220,846	5·53	2·23
York	840	945	3,871	810	4·60	0·86
Total	439,632	448,959	2,841,263	2,015,357	6·46	4·49
Increase	—	9,327	—	—	—	—
Decrease	—	—	—	825,906	—	1·97
SUMMARY.						
I. CENTRAL....	561,694	627,623	6,161,030	5,035,986	10·97	8·02
II. LOWER NORTH	560,286	627,757	7,836,007	6,833,870	13·99	10·89
III. UPPER NORTH	241,778	259,616	2,035,124	1,038,072	8·42	4·00
IV. STH.-EASTERN	275,343	303,196	2,618,292	2,011,703	9·51	6·63
V. WESTERN ..	439,632	448,959	2,841,263	2,015,357	6·46	4·49
OUTSIDE OF COUNTIES ...	900	700	4,500	2,000	5·00	2·86
GRAND TOTAL	2,079,633	2,267,851	21,496,216	16,936,988	10·34	7·47
Increase	—	188,218	—	—	—	—
Decrease	—	—	—	4,559,228	—	2·87

WHEAT FOR HAY.

Division and County.	Area.	Produce.		Average Yield per Acre.		Rainfall. (Approximate Mean.)	
	1913-14.	1912-13.	1913-14.	1912-13.	1913-14.	1912.	1913.
	Acres.	Tons.	Tons.	Tons.	Tons.	In.	In.
I.—CENTRAL—							
Adelaide	45,574	73,714	62,706	1·67	1·38	25·16	21·97
Albert	9,544	8,425	5,856	·67	·61	9·98	10·79
Alfred	9,116	8,575	7,065	·68	·78	10·27	12·59
Carnarvon	201	197	209	1·05	1·04	20·07	17·94
Eyre	9,287	13,139	7,264	·88	·78	12·40	12·41
Fergusson	15,203	17,393	15,444	1·12	1·02	14·89	13·95
Gawler	45,451	68,122	41,063	1·22	·90	13·79	14·08
Hindmarsh	8,337	8,999	9,404	1·22	1·13	19·13	19·36
Light	51,468	78,215	70,585	1·45	1·37	18·84	18·52
Sturt	12,597	13,962	11,636	·83	·92	13·46	15·41
Total	206,778	290,741	231,232	1·24	1·12	15·80	15·70
Increase	—	—	—	—	—	—	—
Decrease	27,248	—	59,509	—	·12	—	·10
II. LOWER NORTH—							
Burra	5,490	7,244	5,851	1·07	1·07	12·53	10·36
Daly	33,110	36,535	29,249	1·10	·88	13·57	12·29
Hamley	759	611	450	·69	·59	13·04	12·68
Kimberley	506	1,752	284	·69	·56	9·86	8·52
Stanley	39,365	53,566	44,000	1·22	1·12	16·12	15·83
Victoria	44,252	69,797	47,340	1·30	1·07	15·84	12·92
Young	362	719	223	1·01	·62	9·63	9·37
Total	123,844	170,224	127,397	1·20	1·03	12·94	11·71
Increase	—	—	—	—	—	—	—
Decrease	17,819	—	42,827	—	·17	—	1·23
III. UPPER NORTH—							
Blachford	321	285	15	·42	·05	10·42	7·14
Dalhousie	7,198	19,683	6,225	1·06	·86	12·75	8·53
Derby	—	—	—	—	—	9·86	6·54
Frome	15,032	19,416	13,512	·83	·90	14·53	10·10
Granville	278	189	6	·54	·02	11·05	8·12
Hanson	312	158	42	·35	·13	11·17	9·29
Herbert	59	965	—	·97	—	11·25	8·39
Lytton	—	—	—	—	—	10·65	7·70
Newcastle	225	2,473	119	·80	·53	11·95	7·20
Taunton	20	—	—	—	—	9·25	5·41
Total	23,445	43,169	19,919	·91	·85	11·29	7·84
Increase	—	—	—	—	—	—	—
Decrease	24,073	—	23,250	—	·06	—	3·45

WHEAT FOR HAY.—continued.

Division and County.	Area.	Produce.		Average Yield per Acre.		Rainfall. (Approximate Mean.)	
	1913-14.	1912-13.	1913-14.	1912-13.	1913-14.	1912.	1913.
	Acres.	Tons.	Tons.	Tons.	Tons.	In.	In.
IV. SOUTH-EASTERN							
Buccleuch	4,038	3,194	2,592	·63	·64	13·38	13·70
Buckingham.....	1,681	2,487	1,643	·83	·98	16·12	18·33
Cardwell	739	363	488	·53	·66	16·02	16·37
Chandos	11,906	14,070	9,631	·85	·81	14·17	14·07
Grey	850	2,692	1,389	1·82	1·63	27·30	23·07
MacDonnell	380	610	378	1·11	·99	25·64	17·46
Robe	402	668	476	1·16	1·18	23·74	18·75
Russell	2,700	2,309	1,497	·60	·55	11·66	14·26
Total	22,696	26,393	18,094	·83	·80	18·50	17·00
Increase ..	—	—	—	—	—	—	—
Decrease ..	9,044	—	8,299	—	·03	—	1·50
V. WESTERN—							
Bosanquet	120	—	85	—	·71	—	—
Buxton	698	359	482	·65	·69	—	—
Dufferin	1,371	716	1,015	·64	·74	11·91	13·92
Flinders	4,492	5,234	4,178	·87	·93	20·36	14·47
Hopetoun	859	710	246	·52	·29	10·56	10·13
Jervois	10,661	8,309	8,950	·72	·84	13·41	11·66
Kintore	1, 81	594	440	·52	·28	11·49	13·96
Le Hunte	80	85	30	·43	·38	15·03	11·13
Manchester	—	28	—	·47	—	9·33	6·53
Musgrave	3,230	3,115	1,931	·76	·60	18·44	12·17
Robinson	5,649	4,152	2,782	·67	·49	13·32	13·30
Way	5,550	2,507	2,152	·44	·39	12·62	12·40
York	5	15	3	1·50	·60	11·10	8·36
Total	34,296	25,824	22,294	·68	·65	13·42	11·64
Increase ..	—	—	—	—	—	—	—
Decrease .	3,667	—	3,530	—	·03	—	1·78
SUMMARY.							
I. CENTRAL......	206,778	290,741	231,232	1·24	1·12	15·80	15·70
II. LOWER NORTH.	123,844	170,224	127,397	1·20	1·03	12·94	11·71
III. UPPER NORTH .	23,445	43,169	19,919	·91	·85	11·29	7·84
IV. SOUTH-EASTERN	22,696	26,393	18,094	·83	·80	18·50	17·00
V. WESTERN	34,296	25,824	22,294	·68	·65	13·42	11·64
OUTSIDE OF COUNTIES	42	93	36	1·33	·86	—	—
GRAND TOTAL .	411,101	556,444	418,972	1·13	1·02	14·39	12·78
Increase ..	—	—	—	—	—	—	—
Decrease .	81,879	—	137,472	—	·11	—	1·61

RETURN SHOWING THE PRODUCTION OF BARLEY, OATS, HAY, AND, PEAS, SEASON 1913-14.

Division and County.	Grain.				Hay.			Peas.
	Barley.			Oats.	Total all Kinds.	Wheaten.	Oaten.	
	Total all Kinds.	Malting.	Cape.					
	Bush.	Bush.	Bush.	Bush.	Tons.	Tons.	Tons.	Bush.
I. CENTRAL—								
Adelaide	73,592	64,184	8,188	23,573	74,776	62,706	10,929	63,731
Albert	1,088	—	706	16,360	6,221	5,856	205	—
Alfred	392	70	122	12,204	7,240	7,065	175	—
Carnarvon	62,898	62,143	755	7,923	2,839	209	2,556	761
Eyre	5,882	214	4,474	8,509	8,081	7,264	197	—
Fergusson	426,456	368,328	54,121	165,672	33,349	15,444	17,898	—
Gawler	106,783	61,835	44,774	35,223	49,298	41,063	7,796	137
Hindmarsh	20,486	14,810	4,801	65,444	18,883	9,404	8,942	30,055
Light	62,359	9,643	50,599	35,889	75,512	70,585	4,693	290
Sturt	23,937	16,993	6,380	43,612	15,236	11,636	2,149	9,035
Total 1913-14	783.873	598,220	174,920	414,409	291,435	231,232	55,540	104,009
Total 1912-13	763,041	545,479	208,415	637,004	355,964	290,741	61,349	124,128
II. LOWER NORTH—								
Burra	1,694	274	664	2,615	6,169	5,851	215	—
Daly	23,716	14,744	8,480	67,967	41,771	29,249	12,474	—
Hamley	—	—	—	—	593	450	6	—
Kimberley	—	—	—	69	284	284	—	—
Stanley	19,699	6,739	12,728	29,171	46,736	44,000	1,785	325
Victoria	16,335	9,744	6,411	35,390	48,230	47,340	601	55
Young	9	9	—	62	223	223	—	—
Total 1913-14	61,453	31,510	28,283	135,274	144,006	127,397	15,081	380
Total 1912-13	65,922	27,726	36,988	260,797	191,332	170,224	19,080	423

RETURN SHOWING THE PRODUCTION OF BARLEY, OATS, HAY, AND PEAS, SEASON 1913-14.—continued.

Division and County.	Grain.				Hay.			Peas.
	Barley.			Oats.	Total for Hay.	Wheaten.	Oaten.	
	Total all Kinds.	Malting.	Cape.					
III. UPPER NORTH—	Bush.	Bush.	Bush.	Bush.	Tons.	Tons.	Tons.	Bush.
Blachford	—	—	—	—	15	15	—	—
Dalhousie	513	123	390	3,810	6,463	6,225	26	—
Derby	—	—	—	—	—	—	—	—
Frome	313	54	204	3,703	13,695	13,512	148	820
Granville	—	—	—	—	6	6	—	—
Hanson	—	—	—	105	58	42	—	—
Herbert	—	—	—	—	—	—	—	—
Lytton	—	—	—	—	—	—	—	—
Newcastle	—	—	—	—	119	119	—	—
Taunton	—	—	—	—	2	—	—	—
Total 1913-14	826	177	594	7,618	20,358	19,919	174	820
Total 1912-13	3,895	379	2,562	27,056	44,009	43,189	179	660
IV. SOUTH-EASTERN—								
Buccleuch	1,964	948	406	30,840	4,356	2,592	1,753	—
Buckingham	5,843	1,368	4,475	44,468	9,703	1,643	8,006	1,701
Cardwell	3,428	1,488	1,940	4,322	1,401	488	882	—
Chandos	2,578	324	1,177	46,075	12,298	9,631	2,667	—
Grey	367,487	345,192	19,058	223,262	29,055	1,389	27,109	183
MacDonnell	7,641	6,400	1,241	20,126	3,757	378	3,349	1,305
Robe	11,154	8,512	2,187	24,424	7,506	476	6,827	351
Russell	5,896	3,917	1,699	20,932	6,066	1,497	2,786	123
Total 1913-14	405,991	368,149	32,183	414,449	74,142	18,094	53,379	3,663
Total 1912-13	444,867	424,946	18,018	480,802	81,458	26,393	52,648	2,189

V. WESTERN—								
Bosanquet	—	—	—	—	85	85	—	—
Buxton	—	—	—	1,690	516	482	34	—
Dufferin	350	210	140	2,903	1,053	1,015	38	—
Flinders	69,419	64,909	4,510	105,626	15,297	4,178	10,997	73
Hopetoun	70	70	—	8	255	246	9	—
Jervois	4,567	3,152	1,145	90,038	13,702	8,950	4,752	—
Kintore	—	—	—	—	455	440	15	—
Le Hunte	90	—	90	630	40	30	10	—
Manchester	—	—	—	—	—	—	—	—
Musgrave	3,668	2,035	1,633	13,529	4,673	1,931	2,727	—
Robinson	1	1	—	7,111	2,829	2,782	47	—
Way	1,936	1,155	781	7,385	2,704	2,152	552	—
York	—	—	—	—	3	3	—	—
Total 1913-14	80,101	71,532	8,299	228,920	41,612	22,294	19,181	73
Total 1912-13	40,800	33,502	7,307	267,149	41,884	25,824	15,913	213
OUTSIDE OF COUNTIES—								
1913-14	470	470	—	70	63	36	25	—
1912-13	200	—	200	700	119	93	26	—
GRAND TOTAL—								
1913-14	1,332,714	1,070,058	244,279	1,200,740	571,616	418,972	143,380	108,945
1912-13	1,318,734	1,032,532	273,490	1,673,508	714,766	556,444	149,195	127,553
Increase	13,980	37,526	—	—	—	—	—	—
Decrease	—	—	29,211	472,768	143,150	137,472	5,815	18,608

KYBYBOLITE AND GREEN PATCH.

COMPARISON OF CLIMATIC AND SOIL CONDITIONS.

(Address by W. J. COLEBATCH, Superintendent of Agriculture in South-East.)

As a result of a visit to Green Patch, near Port Lincoln, Mr. W. J. Colebatch (Superintendent of Agriculture in the South-East) has forwarded to the Minister of Agriculture an interesting comparison between the climatic and soil conditions in the district mentioned and at Kybybolite. In a covering letter Mr. Colebatch states that he spent a week driving round the Green Patch district, and came to the conclusion that the similarities with conditions at Kybybolite were much greater than the differences, and that therefore the Government farm in the South-East should be regarded as of equal importance to the men on the West Coast ironstone gravel country under good rainfall as to the settlers on the Binnum, Kybybolite, Hynam, and Struan estates. The conclusions arrived at by Mr. Colebatch were embodied in an address delivered by him at Charlton, a synopsis of which is as follows :—

CLIMATIC CONDITIONS.

The rainfall charts of the two districts show that in both cases the annual precipitation ranges from 18in. to 36in., with a mean annual fall of from 25in. to 26in. Further it is to be noted that although the average fall is relatively heavy, yet both districts are subject to the same difficulties in the autumn and spring as the drier wheat areas. The bulk of the rain falls in the months of June, July, and August, leading to waterlogging and a consequent drowning out of the young crops, whilst the spring and autumn months are often marked by protracted spells of drought. It would appear that the Green Patch suffers less from hard frosts than Kybybolite, but otherwise the climatic conditions do not differ in any material manner from those experienced between Frances and Hynam.

THE SOIL.

As to the soil, an examination of the various cuttings and sections revealed in some places a very striking similarity with those predominating on the Government Farm in the South-East. The depth of loam overlying the ironstone rubble was greater, and in some instances the rubble was coarser and more angular. From the absence of "crab-hole" areas and "runaway" holes it would appear that the limestone layer underlying much of the Kybybolite and Binnum country is either wanting or more deeply situated at Green Patch; but in any case the depth of yellow clay beneath the rubble is sufficient in both districts to bring about a soggy condition of the soil in the winter and spring. And this is the main cause of unsuccessful cropping in these districts. In general it may be said that the structure and physical character of the soils in question present strong resemblances, and I am much inclined to think that the results obtained at Kybybolite may be taken as applicable to the country I have inspected. The settlers' experiences in both places have been similar.

1. It was quickly observed that the land became boggy, spuey, and even treacherous in seasons of heavy rainfall.

2. Crops, even when put in well, were noticed to make good growth in the autumn and early winter, but about July and August they changed color, became red and then black in the foliage, and developed a sickly, stunted appearance, from which they never recovered.

3. The failure of crops on fallowed land led to a diversity of opinion as to the applicability of the usual methods of wheat growing, and many were prepared to denounce fallowing as useless.

4. Spring-sown wheat and oats sometimes were found to yield as good returns as those seeded in May, and it was concluded that there was no "proper" time to sow cereals. It was merely a gamble with the seasons.

5. In both places it was seen that the crops sown on sloping banks generally yielded better than those on lower levels, and dry seasons were found to suit crops better than wet ones.

DIFFERENCES BETWEEN THE AREAS.

1. The Green Patch country is more undulating, and the slopes are steeper than in the South-East. From the point of view of drainage this is an important difference.

2. The rubble country in the South-East carries heavier timber as a rule. Redgum predominates there, whilst on the West Coast land of similar character carries mostly sugar gum.

TREATMENT.

From the practical standpoint the more important features of these laterite soils are:—

1. The tender character of the land. Soils of this description cannot be handled roughly with advantage, as in the case of a stiff, fat clay. They break down very readily into tilth even with a stroke of the light harrows if worked dry, and this is a serious matter when heavy rains follow within a week of seeding, as such fine-grained soils melt down and dry out again, leaving the paddocks in a worse state than before. Early fallows are often

injured in this way, and re-ploughing is usually the only remedy. For this reason it is to be hoped that spring fallowing with little if any summer working will be found to suit these districts best.

2. The sourness of the land due to the soddening effect of ages of heavy rainfall, the consequent leaching out of the lime from the upper layers of the soil, and the steady accumulation of organic matter. The evidence in favor of the view that the soils in question are acid is abundant and convincing.

(*a*) The appearance of water grasses and sedges in the natural pastures.

(*b*) The moistened soil gives an acid reaction when tested with litmus paper;

(*c*) Repeated trials have shown that there is a limit to the amount of acid fertiliser that may be applied advantageously to these soils. Up to 1cwt. per acre will give payable returns, but over that amount results in diminished yields;

(*d*) The apparent superiority of soil so situated as to be able to shed a good proportion of the surplus moisture it receives is evidence that too much of the winter rains is retained, and land that is long subjected to water logging is bound to be sour.

To remedy this natural defect we must resort to draining and liming. I place draining first, as in my opinion it is useless to discuss the cultivation of these soils unless we are first of all prepared to assist them to quit the surplus winter rains. Unless farmers on land of this character are prepared to face the position, and to set to work in real earnest to accomplish this purpose, I am unable to hold out much hope of success in wet seasons. The whole system of farming adopted on the Kybybolite Experimental Farm is based on a cheap and efficient surface drainage scheme. Underground drainage, even if effective, is not an economical proposition, and mole draining proved unsatisfactory owing to the irregularity of the subsoil.

The system in vogue at Kybybolite is the " plough and crowder " surface channelling, with contributory water furrows. A "crowder" or "delver" is readily made with a couple of sleepers and iron plates, and even if purchased the initial cost would be very light, particularly when shared by two or three neighbors. The main channels should be run across the slope and should be distant from one another a distance of five to 10 chains. The water furrows are traced through immediately after seeding, and the distance between them will vary with the fall, but usually every six or seven chains will be found sufficient. This method can be carried out at a cost of not more than 6d. a chain for the main channels, so that it is within the reach of all enterprising settlers. It will necessitate working the land in strips, and obviously round and round ploughing must give place to the older system. Farmers must remember that the full effects of any drainage scheme will not become apparent at once, and it will be for each man to watch the results in order that he may be in a position to judge the requirements of his own holding as to the frequency and capacity of the channels. The liming of the land must follow, and not precede, drainage. In ironstone soils a sufficiency of lime is demanded in order to guard against the locking up of the soluble phosphates by conversion into iron phosphate. Lime is further needed to sweeten the soil and promote the growth of clovers and trefoils. Without legumes the fattening capacity of the grass and stubble feed is low, and the most satisfactory way of inducing their development is to drain and lime the soil. From 1 ton to 2 tons of ground limestone will be needed as an initial application, and after that from 5cwts. to 8cwts. at intervals of three to five years.

MANURES.

Except in so far as they might prove useful for top-dressing backward crops in September, nitrogenous manures are without effect on cereals in our soils ; nor has potash yet given payable returns at Kybybolite. All forms of phosphatic fertilisers on the local market have been tried, but none have been responded to so well as the 36-38 grade of mineral superphosphate. The acid-soluble and citrate-soluble forms have not succeeded so well as the water-soluble even in wet years. The best results at Kybybolite have been secured from 1cwt. of mineral super. per acre, and this dressing has been adopted as the standard. No doubt as the sweetening of the land proceeds through drainage, liming, and cultivation, the heavier quantities will prove more remunerative, both directly and by reason of important secondary effects.

CULTIVATION.

Ploughing should be done to a depth of 4½in. to 5in., even though this results in the turning up of the rubble. My experience leads me to think that the rubble is better interspersed through the fine-grained loam than left as a layer 3in. to 6in. deep. We have not found that the soil suffered from deep ploughing ; on the contrary, high yields have been obtained the last two years on land that has been treated in this way since 1906. It is therefore a mistake to think that deep ploughing results in impaired fertility. The natural tendency for lime to sink through the soil makes it less likely that the lower layers will be found more acid than the upper ones. With reference to the advisability or otherwise of fallowing, I may say at once that I believe in spring ploughing with one, or at the most two, subsequent working in preparation for wheat. Fallowing is not so essential for other cereals or pulse crops, but, inasmuch as the object of fallowing in our district is to aerate and mellow the soil, there is no doubt that all autumn-sown crops would thrive better on land prepared the previous year. Still, on all farms it is generally necessary to sow an area on autumn ploughing, and the point arises as to whether one is justified in ploughing dry instead of waiting for a useful rain. Our plan is to expend from 1s. 6d. to 2s. per acre on new shares and plough up dry, to secure aeration of the land and an early seeding. Land ploughed dry should be used for oaten hay or oats, and if the rains hold off the seed bed may be got ready and sown during April without fear of disaster.

Experience at Kybybolite showed — (1) Autumn ploughing is about equal in value to "green" ploughing, even in a dry year; (2) summer fallowing proved superior to autumn fallowing, probably because better aeration was obtained; (3) winter fallows yielded better than the autumn, and the spring better than the winter; (4) the unworked ploughing came out best on the late-lifted plots; (5) the spring working was best on the late fallows; (6) an additional summer working was more effective on the early than on the late ploughed fallows; (7) spring ploughed fallow receiving one spring cultivation gave the highest yield.

RESULTS OF FALLOWING EXPERIMENT ON OATS.—KYBYBOLITE EXPERIMENTAL FARM.

Season 1913.

	Yield per acre.	
	Bush.	Lbs.
Alternate cropping without fallow	26	37
Autumn ploughing	23	37
Autumn ploughing, spring cultivation	28	0
Autumn ploughing, spring and summer cultivation	33	1
Winter ploughing	32	34
Winter ploughing, spring cultivation	39	11
Winter ploughing, spring and summer cultivation	46	29
Spring ploughing	35	18
Spring ploughing, spring cultivation	53	5
Spring ploughing, spring and summer cultivation	48	8
Summer ploughing	37	26
Summer ploughing, summer cultivation	33	21
Annual cropping	32	30

PLOUGHING.
Autumn, April 30th to May 1st.
Winter, June 10th.
Spring, September 30th.
Summer, November 20th.

CULTIVATION.
Spring, October 18th.
Summer, November 21st.

SEEDING.

Algerian oats, graded, 1½bush. per acre: 36-38 min. super., 1cwt. per acre.

Seed bed prepared between May 2nd and May 6th. Drilled May 7th-8th. Plots harrowed September 2nd.

(To be continued.)

THE WHEAT MARKET.

Commenting on the wheat position *Beerbohm's Corn Trade List* under date London, May 8th, states :—There has been a further improvement in the demand, both for the United Kingdom and the Continent ; some 30 cargoes have changed hands, prices at the close being about 6d. higher than a week ago for Australian and Plate, and 3d. for other descriptions. The demand is almost entirely for cargoes afloat, there being very little disposition on the part of buyers to operate in distant positions, in view of the favorable crop outlook in most countries. France has bought pretty freely, and is expected to continue doing so. It is still believed that farmers hold fair reserves of wheat, but much of it is of inferior quality, which necessitates a free admixture of good foreign descriptions. Germany also, having exported such a large quantity of native wheat, will continue to be a large importer for some time to come.

Shipments last week were the smallest of any week since the commencement of the season, amounting to 930,000 quarters, of which only 260,000 quarters were for direct ports United Kingdom. This week's total promises to be about 1,250,000 quarters. The net imports into the United Kingdom for the nine months ending 30th April have amounted to 19,476,410 quarters, against 21,497,890 quarters in the corresponding nine months last season. Farmers' deliveries, reckoned on the old basis, have been about 750,000 quarters in excess of those of the previous season, so that the total supplies for the nine months are about 1,250,000 quarters less than last year. Stocks, however, at the ports are 400,000 quarters larger than in 1913, instead of being considerably smaller, and it would appear pretty evident that not only has English wheat been delivered more freely than represented by the quantity mentioned above, but that invisible reserves must have also been drawn upon, and the consumption also smaller than usual.

The Washington Agricultural Bureau report for May gives the condition of winter wheat on the 1st of the month at 95·9, against 95·6 last month, and 91·9 on the 1st of May last year, and 85·5 the average condition of the 10 previous years. At harvest time last year the condition was 81·6. The area abandoned amounts to 1,123,000 acres, leaving 35,387,000 acres to be harvested, against 31,699,000 acres last year. On the basis of this report, and allowing for a normal deterioration of 5½ points between now and harvest, the indicated yield is 630,000,000bush., against 523,561,000bush. last year. It is more than probable, in view of the fact that climatic conditions hitherto have been so exceptionally favorable, that the deterioration in the next two months will exceed the normal. The present outlook, however, is a very promising one, and, with quite an ordinary yield of spring wheat, the total yield would be a record one by many million bushels.

THE WORLD'S VISIBLE WHEAT SUPPLY ON MAY 1.

	European. Quarters.	U.S.-Canada. Quarters.	Total. Quarters.	Eng. Average. Price.
1914......	9,030,000	10,085,000	19,115,000	31/9
1913......	10,290,000	11,000,000	21,290,000	32/2
1912......	10,960,000	11,565,000	22,525,000	37/10
1911......	12,115,000	6,500,000	18,615,000	30/11
1910......	10,160,000	5,935,000	16,045,000	33/-
1909......	7,875,000	6,350,000	14,225,000	42/5
1908......	9,485,000	5,035,000	14,520,000	31/6
1907......	9,480,000	10,400,000	19,880,000	27/-
1906......	9,375,000	7,350,000	16,725,000	29/6
1905......	10,090,000	5,250,000	15,340,000	30/9
1904......	9,780,000	5,925,000	15,705,000	27/8
1903......	6,830,000	7,035,000	13,865,000	26/10
1902......	8,570,000	7,300,000	15,870,000	29/-
1901......	9,075,000	8,175,000	17,250,000	26/8
1900......	8,390,000	9,710,000	18,100,000	26/-
1899......	7,500,000	6,375,000	13,875,000	25/-
1898......	7,500,000	4,260,000	11,760,000	38/4

Date.		LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
May	6	Firmly held, inactive	3/8 to 3/9 ..	3/9½ ..	3/9½
	7	Steadily held, inactive ; Liverpool quiet	3/8½ to 3/9 ..	3/9½ to 3/9¾ ..	3/9½ to 3/9¾
	8	Firm, more inquiry, March-April 4/6½ ; Jan.-Feb. 4/6¾ ; Liverpool, good demand	Do. ..	Do. ..	Do.
	9	Held for advance ; Liverpool firm	3/9 ..	3/9¾ ..	3/9¾
	11	—	3/9 to 3/9½ ..	3/10 to 3/10¼ ..	3/10 to 3/10¼
	12	Very firm ; Australian arrived and off coast ; March-April 4/7½ ; Liverpool firm, held for advance	Do. ..	Do. ..	Do.
	13	Opened sellers asking advance, closed quiet ; Liverpool firmly held, inactive	Do. ..	Do. ..	Do.
	14	Dull, easier tendency ; Liverpool quiet	Do. ..	Do. ..	Do.
	15	Neglected, lower to sell ; Liverpool steady, quiet	Do. ..	Do. ..	Do.
	16	Firm, Australian to arrive. 4/7⅞ ; Feb.-March 4/7½ ; Liverpool firm, held for advance	3/9½ ..	3/10¼ ..	3/10¼
	18	—	3/9½ to 3/10 ..	Do. ..	Do.
	19	Steady, quiet ; Liverpool steadily held, not active	Do. ..	3/10¼ to 3/10½ ..	3/10¼ to 3/10½
	20	Steady, quiet, Feb.-March 4/8 ; Liverpool quiet	Do. ..	Do. ..	Do.
	21	Steady, quiet	Do. ..	Do. ..	Do.
	22	Firm, quiet ; Feb.-March 4/8 ; Liverpool steadily held, not active	Do. ..	Do. ..	Do.
	23	Quiet	Do. ..	Do. ..	Do.
	25	—	Do. ..	Do. ..	Do.
	26	—	3/10 ..	Do. ..	Do.
	27	Quiet ; Liverpool very dull, lower to sell	Do. ..	Do. ..	Do.
	28	Very dull, no demand	Do. ..	Do. ..	Do.
	29	Steady ; Liverpool dull	Do. ..	Do. ..	Do.
	30	Firm, but quiet ; Liverpool quiet	Do. ..	Do. ..	Do.
June	1	—	Do. ..	Do. ..	Do.
	2	—	Do. ..	3/10¼ ..	3/10¼
	3	Quiet	Do. ..	Do. ..	Do.
	4	Steady ; Liverpool quiet ; Australian off coast, buyers 4/7⅝ ..	Do. ..	Do. ..	Do.
	5	Steady, quiet, Feb.-March 4/7⅞	Do. ..	Do. ..	3/10½
	6	Firm, quiet ; Australian arrived, 4/7½ ; Liverpool steady ..	Do. ..	Do. ..	Do.

Steamer Freights.—(June 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 21s. per ton (6$\frac{7}{10}$d. per bushel) ; to South Africa, 20s. per ton (6⅖d. per bushel). Parcels, Port Adelaide to London-Liverpool, or Continent, 20s. per ton (6⅖d. per bushel) ; Port Adelaide to Melbourne, 12s. per ton (3⅘d. per bushel) ; to Sydney, 14s. 6d. per ton (4⅗d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 20s. to 21s. 3d. per ton (6⅖d. to 6⅘d. per bushel) ; South Africa, 18s. 9d. per ton (6d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

The General Manager of the Government Produce Department reports on June 1st :—

Butter Factory.—There was a slight increase in the quantity of the cream received at the factory during last month, and the quality generally was better. The price of butter eased slightly, and present prices are—Superfine, 1s. 3½d. per lb.; pure creamery, 1s. 2½d. per lb.

A. W. Sandford & Co., Limited, report on June 1st—

Butter.—Local supplies have shown a fair increase, but are still far short of requirements, heavy consignments being brought along from Victoria, New South Wales, and Queensland to fill up the shortage. Values have only shown slight fluctuations—"Alfa" is selling at 1s. 3½d.; "Primus," 1s. 2½d.; choice separators and dairies, 1s. to 1s. 1d.; store and collectors', 10d. to 11d. per pound.

Eggs.—Rates ruling throughout the month have been very stationary, with the exception of the last market, when values firmed 2d. per dozen. Holders of refrigerated and pickled sorts are now anxious to quit, as it is getting late in the season. Hen eggs, 1s. 8d.; duck, 1s. 9d.; refrigerated, 1s. 4d.; well preserved, 1s. to 1s. 0½d. per dozen.

Cheese.—Very extensive business has been put through both for local and Broken Hill orders, so that stocks held at the moment by factories are light, and prices record an improvement of ½d. Present quotations are from 8d. to 8½d. per pound for large to loaf.

Honey.—Sales have not been quite so active, owing to purchasers having stocked up fairly heavy quantities. However, there is no quotable alteration in price, prime clear extracted selling at 3d. per pound; beeswax, 1s. 2½d. per pound.

Almonds.—The forwardings have not been equal to export orders, and rates have firmed accordingly. Brandis are 7½d.; mixed softshells, 6½d.; hardshells, 3½d.; kernels, 1s. 7d. per pound.

Bacon.—Bacon pigs have been scarce, and supplies are not equal to demand, heavy parcels have therefore been received from the East, and values show an easing tendency. Best factory-cured sides sell at 9d. to 10½d. per pound; hams, 9d. to 11d.; lard in skins, 8d.; bulk, 6½d. to 7d. per pound.

Live Poultry.—The catalogues submitted during the month have been very large, but owing to the high figures ruling for fresh meat values have shown a good improvement, with the result that consignors are taking advantage of the nice prices and forwarding each week. Good table roosters brought 3s. 3d. to 4s. each; hens and nice-conditioned cockerels, 2s. to 2s. 9d; light sorts lower; ducks, 2s. 6d. to 3s. 4d.; geese, 4s. 3d. to 5s.; pigeons, 7d.; turkeys, from 7d. to 10d. per pound live weight for medium to good table birds.

Potatoes and Onions.—Substantial supplies of potatoes have arrived, chiefly from the South-East, and in sympathy with the markets of the other States prices have eased. Onions—The onion market has been very quiet, and a tendency to lower rates was only checked by a few export orders. Present quotations—Potatoes, £4 12s. 6d. to £6 per ton of 2,240lbs. on truck Mile End or Port Adelaide; 5s. to 7s. per cwt. in the market. Onions—£7 per ton of 2,240lbs. on truck Mile End or Port Adelaide; 7s. to 8s. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of May, 1914, also the average precipitation to the end of May, and the average annual rainfall.

Station.	For May, 1914.	To end May, 1914.	Av'ge. to end May.	Av'ge. Annual Rainfall
Far North and Upper North.				
Oodnadatta	0·29	3·10	2·27	4·76
Tarcoola	0·66	1·07	2·39	7·58
Hergott	0·04	4·30	2·53	6·04
Farina	0·04	2·77	2·85	6·70
Leigh's Creek	0·02	2·38	3·74	8·66
Beltana	0·03	1·93	3·89	9·22
Blinman	0·03	2·11	5·24	12·85
Hookina	0·30	1·98	—	—
Hawker	0·46	1·82	3·92	12·22
Wilson	0·37	1·12	3·91	11·78
Gordon	0·36	1·35	3·12	10·26
Quorn	0·58	1·69	4·41	13·78
Port Augusta	0·62	2·36	3·72	9·46
Port Augusta W.	0·50	2·00	3·28	9·36
Bruce	0·39	1·80	3·05	10·01
Hammond	0·31	1·81	3·93	11·46
Wilmington	0·80	2·29	5·95	18·26
Willowie	0·52	2·49	3·87	11·90
Melrose	1·00	2·79	7·61	23·04
Booleroo Centre	0·87	2·57	4·97	15·83
Port Germein	0·96	2·32	4·76	12·84
Wirrabara	1·33	4·23	5·95	18·91
Appila	0·79	2·35	5·07	15·08
Cradock	0·20	1·13	3·61	10·86
Carrieton	0·26	1·49	3·95	12·22
Johnburg	0·33	2·01	3·24	10·21
Eurelia	0·32	1·51	4·30	13·24
Orroroo	0·49	2·32	4·65	13·42
Black Rock	0·44	2·49	4·24	12·25
Petersburg	1·08	3·84	4·37	13·07
Yongala	1·06	3·36	4·34	13·94
North-East.				
Ucolta	0·37	1·74	—	—
Nackara	0·29	1·87	—	—
Yunta	0·62	1·97	3·23	8·22
Waukaringa	0·30	2·30	3·00	7·94
Mannahill	0·32	2·20	3·23	8·46
Cockburn	0·28	1·82	3·28	7·97
Broken Hill, NSW	0·33	1·94	3·86	9·63
Lower North.				
Port Pirie	0·78	2·49	5·82	13·21
Port Broughton	1·31	3·64	4·89	14·33
Bute	1·62	4·04	4·96	15·42
Laura	1·06	2·68	5·70	18·22
Caltowie	0·82	2·04	5·44	17·27
Jamestown	1·02	2·63	5·28	17·46
Gladstone	1·00	2·11	5·06	16·00
Crystal Brook	1·48	3·29	5·10	15·62
Georgetown	0·92	2·61	5·99	18·32
Narridy	0·92	2·53	4·46	16·79
Redhill	1·34	3·42	6·38	16·79
Spalding	1·38	2·91	5·61	20·25
Lower North—*continued.*				
Gulnare	1·21	2·66	5·29	19·74
Bundaleer W. Wks.	1·16	2·32	4·77	17·29
Yacka	0·89	2·02	4·78	15·27
Koolunga	1·00	2·71	5·03	15·94
Snowtown	1·25	3·11	5·09	15·70
Brinkworth	1·36	2·94	4·59	15·48
Blyth	1·51	2·30	5·48	16·34
Clare	2·38	4·76	7·67	24·30
Mintaro Central	1·68	3·41	6·40	21·99
Watervale	2·41	4·97	8·45	27·17
Auburn	2·14	3·91	7·83	24·25
Hoyleton	1·26	2·71	6·04	17·96
Balaklava	0·84	3·33	5·62	16·03
Port Wakefield	0·59	3·64	5·16	13·13
Terowie	0·53	2·24	4·38	13·71
Yarcowie	0·90	3·04	4·46	13·91
Hallett	1·34	2·96	4·87	16·40
Mount Bryan	1·14	2·31	4·48	15·73
Burra	1·36	2·87	5·59	17·82
Farrell's Flat	1·41	3·22	5·93	18·87
West of Murray Range.				
Manoora	1·25	3·98	5·69	18·09
Saddleworth	1·46	4·15	6·54	19·69
Marrabel	1·38	5·14	5·96	18·94
Riverton	1·80	5·08	6·62	20·48
Tarlee	1·59	5·31	5·79	17·48
Stockport	1·23	4·91	5·06	15·89
Hamley Bridge	1·21	4·17	5·40	16·45
Kapunda	1·16	6·47	6·48	19·67
Freeling	1·41	3·78	5·58	17·85
Greenock	1·55	5·67	6·49	21·46
Truro	1·37	5·39	5·85	19·74
Stockwell	1·25	4·92	6·01	20·30
Nuriootpa	1·62	5·18	6·27	21·25
Angaston	1·80	5·84	6·48	22·25
Tanunda	2·43	7·47	6·91	22·28
Lyndoch	1·61	6·89	6·55	23·01
Adelaide Plains.				
Mallala	1·12	3·81	5·63	16·88
Roseworthy	0·90	4·34	5·54	17·31
Gawler	1·60	6·63	6·42	19·21
Two Wells	1·06	5·21	5·53	16·36
Virginia	1·38	4·83	5·93	17·58
Smithfield	1·52	5·18	5·54	17·30
Salisbury	1·41	5·64	6·31	18·57
North Adelaide	1·86	6·57	6·82	21·49
Adelaide	1·35	5·62	7·00	21·04
Brighton	1·68	4·17	6·38	19·93
Glenelg	1·35	4·24	6·10	18·35
Magill	1·78	7·12	8·41	25·69
Glen Osmond	1·89	6·26	7·57	25·20
Mitcham	1·95	6·21	7·30	23·47
Belair	2·59	5·87	9·12	28·64

RAINFALL—*continued.*

Station.	For May, 1914.	To end May, 1914.	Av'ge. to end May.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.				
Houghton	—	—	—	—
Teatree Gully	1·89	7·98	8·96	28·19
Stirling West	4·87	12·47	13·47	46·70
Uraidla	3·92	11·27	12·90	44·35
Clarendon	2·82	8·14	10·51	33·67
Morphett Vale	1·71	6·44	7·54	23·32
Noarlunga	1·72	5·01	6·58	20·28
Willunga	2·70	6·48	8·32	25·98
Aldinga	1·80	5·66	6·44	20·34
Normanville	2·38	7·63	6·62	20·65
Yankalilla	2·22	7·76	7·47	22·78
Cape Jervis	1·74	6·08	5·11	16·34
Mount Pleasant	2·34	8·27	7·82	26·87
Blumberg	2·51	10·13	8·39	29·38
Gumeracha	3·33	10·78	9·65	33·30
Lobethal	2·92	10·11	9·68	35·38
Woodside	2·96	9·08	8·74	31·87
Hahndorf	2·97	8·77	9·86	35·45
Nairne	2·47	8·00	8·74	28·83
Mount Barker	2·95	9·09	9·30	30·93
Echunga	3·29	10·40	10·02	32·83
Macclesfield	2·51	9·51	8·90	30·72
Meadows	3·55	11·29	10·63	35·52
Strathalbyn	1·57	5·75	6·32	19·28
MURRAY FLATS AND VALLEY.				
Wellington	0·60	4·55	5·20	15·01
Milang	0·76	3·31	5·52	16·08
Langhorne's Bdge	0·76	4·72	5·04	15·27
Tailem Bend	0·57	4·45	—	—
Murray Bridge	0·57	3·33	4·95	14·32
Callington	0·99	4·43	5·26	15·65
Mannum	0·44	3·73	4·31	11·67
Palmer	0·64	4·02	4·70	15·60
Sedan	0·84	3·66	3·96	11·92
Blanchetown	0·70	1·60	4·07	10·71
Eudunda	1·06	4·06	5·35	17·33
Sutherlands	0·72	3·27	3·03	10·60
Morgan	0·62	1·91	3·28	9·29
Overland Corner	0·51	3·35	4·21	11·42
Renmark	0·47	2·70	3·64	10·93
Loxton	0·31	1·93	—	—
WEST OF SPENCER'S GULF.				
Eucla	0·54	1·72	4·59	10·13
White Well	—	1·12	3·23	9·67
Fowler's Bay	0·31	1·60	4·13	12·11
Penong	0·43	2·60	3·95	11·93
Murat Bay	0·28	1·69	—	—
Smoky Bay	0·92	3·13	—	—
Streaky Bay	1·22	3·87	4·67	15·31
Port Elliston	1·63	4·93	4·53	16·49
WEST OF SPENCER'S GULF—*continued.*				
Port Lincoln	1·48	5·39	6·04	19·88
Tumby	1·38	5·32	4·60	15·00
Carrow	0·97	4·38	—	—
Cowell	0·90	3·65	4·56	11·76
Point Lowly	0·71	1·37	4·33	12·21
YORKE'S PENINSULA.				
Wallaroo	2·13	5·66	5·07	14·05
Kadina	1·77	4·37	5·53	15·88
Moonta	2·41	6·93	5·44	15·22
Green's Plains	1·56	3·70	5·02	15·73
Maitland	2·05	6·35	6·44	20·08
Ardrossan	1·08	3·97	4·61	13·89
Port Victoria	1·43	4·60	5·20	15·20
Curramulka	1·60	7·91	5·58	18·51
Minlaton	1·34	7·16	5·38	17·41
Stansbury	1·32	5·20	5·39	17·06
Warooka	1·43	6·77	5·39	17·71
Yorketown	1·29	5·52	5·39	17·47
Edithburgh	1·78	5·87	5·51	16·48
SOUTH AND SOUTH-EAST.				
Cape Borda	3·48	8·87	7·44	25·09
Kingscote	1·48	6·15	5·88	18·95
Penneshaw	2·40	7·19	6·80	21·34
Cape Willoughby	1·96	5·35	6·09	19·69
Victor Harbor	1·53	5·17	7·16	22·18
Port Elliot	1·39	4·95	6·71	20·33
Goolwa	1·38	5·36	6·07	17·93
Pinnaroo	0·61	2·76	5·21	16·74
Parilla	0·69	4·12	—	—
Lameroo	0·98	3·89	5·05	16·55
Parrakie	0·65	2·99	—	—
Geranium	0·72	3·83	—	—
Peake	0·85	4·68	—	—
Cooke's Plains	0·69	4·24	4·63	14·74
Meningie	1·40	4·64	6·11	18·87
Coonalpyn	1·41	5·95	5·42	17·49
Tintinara	1·68	5·60	5·97	18·78
Keith	1·58	6·83	—	—
Bordertown	1·27	4·42	5·98	19·76
Wolseley	1·40	5·85	5·50	17·72
Frances	1·41	5·45	6·04	20·74
Naracoorte	1·91	6·57	6·73	22·60
Penola	2·03	5·47	8·23	26·78
Lucindale	1·81	5·70	6·83	23·32
Kingston	1·96	7·99	7·53	24·73
Robe	2·31	7·73	7·48	24·69
Beachport	2·54	7·87	8·39	27·51
Millicent	3·25	9·82	9·20	29·25
Mount Gambier	2·76	7·13	10·14	32·00
C. Nrthumberland	2·34	8·97	8·26	26·62

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.	
		June.	July.
Albert	*	—	—
Amyton	*	—	—
Angaston	*	6	4
Appila-Yarrowie	1185	—	—
Arden Vale & Wyacca	1182	—	—
Arthurton	*	—	—
Balaklava	*	—	—
Beaufort	1193	4	2
Beetaloo Valley	1185	—	—
Belalie North	*	6	4
Berri	1204	6	4
Blackwood	1220	8	13
Blyth	1194	6	4
Booleroo Centre	*	26	—
Borrika	1211	—	—
Bowhill	*	—	—
Burra	*	5	3
Bute	1198	—	—
Butler	*	—	—
Caltowie	*	6	4
Canowie Belt	1186	—	—
Carrieton	*	4	2
Cherry Gardens	1221	2	7
Clanfield	1219	—	—
Clare	1194	5	3
Clarendon	*	8	6
Claypan Bore	1213	3	7
Colton	1199	6	4
Coomandook	*	—	—
Coomooroo	1182	—	—
Coonalpyn	1214	—	—
Coonawarra	*	—	—
Coorabie	1199	—	—
Cradock	*	—	—
Crystal Brook	*	—	—
Davenport	*	—	—
Dawson	*	—	—
Dingabledinga	*	—	—
Dowlingville	†	—	—
Elbow Hill	*	—	—
Forest Range	1229	4	2
Forster	1214	6	4
Frances	*	5	3
Freeling	*	—	—
Friedrichswalde	†	—	—
Gawler River	*	—	—
Georgetown	1186	6	4
Geranium	1219	27	25
Gladstone	‡	—	—
Glencoe	*	—	—
Goode	1204	—	—
Greenock	*	—	—
Green Patch	*	8	6
Gumeracha	*	2	7
Halidon	*	—	—
Hartley	†	3	8
Hawker	*	8	6
Hookina	*	2	7
Inman Valley	†	—	—
Ironbank	1222	5	3
Julia	*	—	—
Kadina	1199	2	7
Kalangadoo	*	13	11
Kanmantoo	1222	6	4
Keith	1231	6	4
Kingscote	*	2	7
Koppio	1200	11	9
Kybybolite	1230	4	2
Lameroo	*	—	—
Laura	1186	5	3
Leighton	1187-8	—	—
Lipson	*	—	—
Longwood	1229	3	8
Loxton	*	—	—
Lucindale	*	13	11
Lyndoch	1195	4	2
MacGillivray	1222	—	—
Maitland	1198	4	2
Mallala	1195	1	6
Mangalo	*	6	4
Mannum	*	27	25
Mantung	1214	—	—
Meadows	*	2	7
Meningie	†	6	4
Millicent	*	9	7
Miltalie	*	6	4
Minlaton	*	4	2
Mitchell	1201	6	4
Monarto South	1214	—	—
Monteith	*	—	—
Moonta	1199	—	—
Moorlands	*	—	—
Morchard	*	—	—
Morgan	1219	6	—
Morphett Vale	†	—	—
Mount Barker	1223	3	8
Mount Bryan	1188	6	4
Mount Bryan East	1193	6	4
Mount Compass	*	—	—
Mount Gambier	1230	13	—
Mount Pleasant	1230	12	10
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Branch.	Report on Page	Dates of Meetings.	
		June.	July.
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Myponga	1225	—	—
McNamara Bore	*	—	—
Nantawarra	1196	3	8
Naracoorte	1231	13	11
Narridy	*	—	—
Narrung	1227	—	—
North Booborowie	*	—	—
North Bundaleer	1188	—	—
Northfield	1197	2	7
Orroroo	1183	—	—
Parilla	1214	—	—
Parilla Well	†	—	—
Parrakie	1215	6	4
Paskeville	*	4	2
Penola	*	6	4
Penong	1202	13	11
Petina	*	—	—
Pine Forest	†	2	7
Pinnaroo	1216	—	—
Port Broughton	1188	5	3
Port Elliot	1230	20	18
Port Germein	*	—	—
Port Pirie	1188-93	—	—
Quorn	*	—	—
Redhill	1189-93	2	7
Renmark	*	—	—
Riverton	*	—	—
Roberts and Verran	1204	—	—
Saddleworth	*	19	17
Salisbury	*	2	7
Shannon	*	—	—
Sherlock	*	—	—
Spalding	1190	5	17
Stockport	*	—	—
Strathalbyn	†	—	—
Sutherlands	*	6	—
Tarcowie	1184	2	7
Tatiara	*	6	4
Tintinara	*	—	—
Two Wells	1197	—	—
Uraidla and Summert'n	1228	1	6
Utera Plains	1203	6	4
Waikerie	*	—	—
Warcowie	*	—	—
Watervale	1198	—	—
Wepowie	1184	—	—
Whyte-Yarcowie	1190-2	—	—
Wilkawatt	1218	—	—
Willowie	*	26	—
Willunga	*	6	4
Wilmington	1184	3	8
Wirrabara	1185	6	—
Wirrega	*	—	—
Woodside	1229	—	—
Wynarka	1219	—	—
Yabmana	*	—	—
Yadnarie	1203	6	4
Yallunda	1204	—	—
Yongala Vale	1193	8	6
Yorketown	*	13	11

* No report received during the month of May. † Formal report only received.
‡ Held over until next month.

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ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

June 10th and July 8th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

ARDEN VALE AND WYACCA (Average annual rainfall, 16·65in.).

May 12th.—Present: six members and two visitors.

Conservation of Water and Fodder.—The Chairman (Mr. J. H. Willis) read a paper. He advised the excavation of large dams in the dry northern areas. Water conserved by this means was not only available for stock, but in some seasons a small plot of vegetables could be irrigated. Last year, by this means, he had secured 7cwts. of trombones, tomatoes, cucumbers, beans, turnips, carrots, parsnips, cabbages, cauliflowers, and melons of all descriptions, all of which had been watered from one dam. This dam had only been empty for one week during the past 11 years. A windmill alongside pumped the water into a large tank near the homestead, for convenience in watering the garden, fowls, pigs, &c. Dealing with the conservation of fodder, the paper continued—"I would strongly advise farmers to use the binder much more in the future and to use the harvester less. Farmers who used the harvester in this district during the good seasons—1909 and 1910—and did not use the chaff carrier, lost all the cocky chaff, which, in my opinion, is a valuable fodder in the time of drought. When the crop is long enough I recommend the binder, not only for hay, but also for the wheat crop, which can be cut eight or 10 days before the crop is ready for the harvester. The crop should be stooked in large stooks, of say not less than 50 sheaves, and can be left in the paddock until the stripping is finished; then it can be carted, headed, and stacked. For heading I prefer the double disc header, which is a strong and light running machine. Four men can work it and stack the straw. I am now using a stack of headed straw that was put up seven years ago, and is as good as when put in. The cocky chaff and also the hay I am using was stacked four or five years ago. If it were not for these reserve stacks my stock would be in a bad way to-day. The wheat from the straw in question realised top price and averaged from 5bush. to 7bush. to the acre more than that which was left for the stripper, which was bleached by heavy winds and rain, and for which I received 4d. per bushel less. Cutting the crop with the binder lessens the risk of losses through storm or hailstones, and the value of the straw fully repays the extra labor. In conclusion, I would strongly advise farmers to keep two years' hay on hand in the good seasons, and stack all the cocky chaff and straw possible. It will be very acceptable in the dry years."

COOMOOROO (Average annual rainfall, 11in. to 12in.).

May 9th.—Present: six members and three visitors.

Hay and Straw Stacks.—The Hon. Secretary (Mr. W. M. Robertson) in a paper emphasised the need for farmers to provide against possible dry seasons by storing hay and straw. Another drastic mistake made by some was to overstock their holdings during good seasons. Had farmers made some provision by conserving some of the straw and wheaten chaff during the past few years, thousands of pounds worth of stock would have been saved. Mr. W. Robertson had been troubled with mice in his haystacks. Mr. R. G. Polden advised fencing the stacks with 2ft. 6in. sheet iron, put 2ft. in the ground.

Supports should be on the inside; the fence should be a few feet away from the stack. Another preventive was to cut the hay before the grain developed; the mice would then not trouble it. Mr. E. Brice advised building stacks on chaff or straw, and covering them with straw. Mr. Berriman preferred straw to wheaten chaff for stock feed. He would cut a crop intended for hay on the green side, there was then no danger of horses being affected through eating too much grain. Oats and wheat should not be sown together for hay, as it was difficult to ensure their fitness to cut at the same time.

MOUNT REMARKABLE (Average annual rainfall, 14·48in.).

May 6th.—Present: 11 members.

Experimental Plots.—The Chairman (Mr. N. S. Giles, B.Sc.) was appointed to conduct wheat variety tests. Three-acre plots were to be sown with 1cwt. super. and 1bush. per acre of the following wheats:—Federation, American No. 8, Marshall's No. 3, Yandilla King, Thew, and Bayah.

Co-operation.—Mr. G. Casley read a paper under this heading. He urged on farmers the need for co-operating in their purchases and in the sale of their produce. Members of the Agricultural Bureau especially should adopt this system, he said. The paper was discussed at length.

ORROROO (Average annual rainfall, 13·42in.).

May 9th.—Present: 17 members and two visitors.

Fattening Pigs.—The following paper was read by Mr. H. Chapman:—"Pigs require a comfortable sty, not too small, *i.e.*, about 25ft. by 40ft. for about six or eight pigs. It is not advisable to overcrowd, as the animals will then struggle and fight to obtain their food, the weaker ones having a bad time. Always keep the sties clean and dry, and in winter time as warm as possible. This is a big help when fattening. In the summer, an open shed with a straw roof is necessary to keep them cool. If convenient, a small waterhole in the sty will help to keep them in a better state. If they are running out, they frequently make to the nearest water for a roll, and if not protected, the heat will discourage them to eat, whereas, if kept cool, they are able to eat as usual. Give them plenty of milk with a little pollard or grain; the milk alone is not sufficient to fatten growing pigs. When commencing to feed with pollard, do not give them too much, as it will probably sicken them. Do not change their food suddenly, as this will cause them to scour; bring them to it gradually. When fattening pigs it is best to give them a small quantity of light food, and increase the amount and the quality as they become accustomed to it. If they are allowed to have too much it will sometimes kill them. Feed them four or five times a day, and give them a quantity that they can manage comfortably, instead a giving them two big feeds a day. Some owners leave food in the troughs, but it then becomes stale and sour, and the pigs will not eat it unless they are forced. Allow the milk to stand some time rather than give it to the pigs direct from the separator; the pollard I like to soak, or scald, as it goes farther, and is better for the pigs. The Berkshire gives as good results as any; the half-bred Tamworth also gives splendid results." Mr. Tapscott had found the Poland-China and Berkshire cross very satisfactory. Mr. Cadzow mentioned that hay chaff, if soaked, proved an economical ration. Mr. Bennett had secured good results with milk and bran. Members considered that milk and wheat made perhaps the best and firmest bacon. Lucerne chaff, soaked and mixed with a little pollard, kept pigs in good condition.

Beautifying Farm Homesteads.—At the previous meeting (April 11th) the following paper was contributed by Miss Tapscott:—"One of the first things a settler should do, after erecting sheds and other necessary buildings, is to beautify his home. A few rows of gum trees make a nice plantation, as also English elm, carob trees, and Norfolk Island pines. I prefer evergreen trees to deciduous, as the latter create too much rubbish when losing their foliage. When planting, put them in systematically, as they will look better than those planted at irregular distances. The best system is in rows, about 8ft. between each tree in the row, and 8ft. between the rows. Ornamental grasses or lucerne could be grown between the rows, if necessary. A flower garden also helps to make a home attractive. In years similar to this pot plants are about as much as anyone can manage. A vegetable patch looks nice, besides being so useful. Trees often make a poor house look comfortable, while a good house without trees looks deserted. The carob always looks fresh, and the beans produced make good food for cattle. Pepper trees look well for a few years, but then begin to look shabby and after a while die, whereas a gum does not go off in this way. A fruit garden is attractive and useful. For the first few years pruning should be done with the object of shaping the trees."

TARCOWIE (Average annual rainfall, about 15in.).

May 5th.—Present: five members and 21 visitors.

Seeding.—Mr. John Symons read a paper. He said—"Wheat intended for seed should be left standing until thoroughly ripe before being reaped. Green grains produce weak, delicate plants, which are liable to develop disease. Clean the wheat thoroughly and see that all broken grains, as well as other seeds, are taken out. It will pay better to give this to fowls or pigs. Have the seed bed in good order. Cultivate the fallow not more than 3in. deep, rather less if anything. If the soil comes up rough, use a rib roller made of tee iron with a 2in. flange. This will make a nice smooth surface for the drill. If the land is fine, hang a light harrow behind the cultivator in lieu of rolling. If possible, sow after a good rain, of say 1½in., but should the season be late be careful not to cover the wheat with more than 1in. of soil; rather leave some of the grain on top than drill any deeper. Then go over it with a set of light harrows to level the ground and cover any grains that may be showing. In this way there will be less malting of seed. For dry sowing I prefer unpickled wheat. I would not advise sowing wheat too thickly, as where the wheat stools well the heads are bigger and fill better than in a crop where it is too thick to stool. I recommend seed from another district every second year. Where wheat is sown on the same class of land year after year it has a tendency to produce weak, puny plants. Fifty pounds of good clean seed sown with 60lbs. of super. to the acre is quite sufficient. Late varieties, such as Dart's Imperial, Marshall's No. 3, or Unity, stool well, and are suitable for this district. In my experience late varieties do better than early in late districts, either for wheat or hay. I would advise sowing early wheat a little thicker; about 1bush. per acre. Leave the early varieties till last when seeding, as they usually run up to ear quickly, and are not improved by being fed off. Sufficient early wheat to enable one to get on with the harvesting only should be sown in this district." Mr. Burgess agreed that shallow drilling was best. Mr. W. Ninnes concurred in respect to "white" land, but in other soils would drill to a depth of 4in. He thought it preferable to sow 70lbs. of seed to the acre. Mr. Breuer would sow 50lbs. of wheat for grain, but 80lbs. for hay.

WEPOWIE (Average annual rainfall, 13in. to 14in.).

May 12th.—Present: nine members and five visitors.

Feeding Stock.—Mr. C. W. Knauerhase read a short paper. One bag wheaten chaff, one bag hay chaff, 8lbs. pollard mixed and damped with three parts water and one part molasses, constituted feed suitable for mornings, mid-day, or the first feed at night. After the first feed at night, equal parts of wheaten hay and chaff should be used; and for a change, hay, which could be mixed with sheaved straw, when the horses were not working. The morning feed should be given at least one and a half hours before the horses began work, and the same time was necessary for the mid-day meal. Cows fed on straw chaff and bran gave good results. Pigs should receive boiled wheat and pollard three times per day.

WILMINGTON (Average annual rainfall, 18·26in.).

May 6th.—Present: 12 members.

Seed Wheat.—The Hon. Secretary (Mr. B. Jericho) read a paper. He said—"If experimental farms count for anything, and if the work done on those places should be a guide to outsiders, there can be one class of wheat for seed only, namely, the best and cleanest sample. Many practical farmers will argue otherwise, and maintain that in certain seasons good average yields have been got from decidedly shrivelled and inferior seed. However, the germinating power is not as strong in an inferior grain as in the plump, healthy, and well-filled out one. In the selection of seed for experimenting purposes as to rust and drought resistant wheats the late William Farrer has done an immense amount of good for Australia. He maintained that the better the seed the better the roots—the more parental nourishment the roots get apart from soil stimulants the better able are they to resist dry periods, rust, &c. Careful selection of seed has been one of the most powerful influences in developing wheat, and at the present time the most experienced affirm that the experimenting stage is only in its infancy. On one of the many trial farms in America—by careful selection of seed only—in four years six heads were doubled in length, the number of grains in each head nearly trebled, and the stooling out power of the plants increased more than five fold. Ninety-six tests with seed of numerous descriptions and quality gave an average of 15 per cent. in favor of selecting the best seed. The total output of wheat-producing countries would be increased by many millions of bushels were a sample of wheat sown that produced only one grain more in each head.

By the aid of graders and the use twice or three times of the ordinary winnower, seed wheat can be secured without resorting to the slow work of land selection." Members differed in opinion as to the germinating power of plump and shrivelled wheat. The plump grain supported the plant better from the start, but it was more subject to malting.

WIRRABARA (Average annual rainfall, 18·91in.).

May 9th.—Present: 16 members and two visitors.

Fertilisers.—A short paper on this subject was contributed by Mr. E. H. Piper. He considered 80lbs. per acre a sufficient dressing of super. for fallow land. For a hay crop, on stubble land, 100lbs. per acre should be applied. A light dressing of decayed stable manure, applied annually, was of distinct advantage to the garden. It was unwise to apply stable manure to land to be sown for hay, as in dry seasons this might result in a tendency to blight. Mr. P. J. Curnow favored bone super. for fruit trees, and members generally agreed that it would be an advantage to apply heavier dressings of super. to wheat crops.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

APPILA-YARROWIE (Average annual rainfall, 15·08in.).

May 8th.—Present: eight members.

Experimental Plots.—Mr. Wurst and Mr. J. W. Lines intimated that they intended to conduct tests with different quantities of seed and super. The following committee was appointed to inspect the plots:—Messrs. J. Daly, J. W. Lines, and W. Francis.

Feeding Sheep on Chaff.—Mr. Daly mentioned that several farmers in the district were endeavoring to ascertain, by enclosing five or six sheep in a small yard, whether these animals could be fattened on chaff. The condition put on in three or four weeks by station-bred sheep was remarkable.

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

May 4th.—Present: eight members and two visitors.

Seeding.—Mr. Murphy read a paper dealing with this subject. It was important, he said, to have the soil in good condition to receive the grain. According to its nature it should be worked to a depth of from 4in. to 8in.; rich, heavy soils would stand deeper working than those of a light, shallow nature. The seed bed should be worked fine and loose, but not deep. Fallowing cleaned the land of weeds, and conserved moisture, and for these reasons was preferable to "green" land. Seeding should be commenced about the second or third week in April, and finished in June. Early sowing was best for hay, as the wheat grew taller and thicker than when late sown. For grain, late varieties should be sown early, and early varieties late. When an early variety was sown early, it was liable to damage by frosts and storms during a critical period of its growth. With the late wheat sown late the weeds were likely to make as much growth as the wheat, and the grain ripened at a period when hot winds were prevalent, probably resulting in pinched grain. In this locality, at present, the soil was in a damp condition, on account of the frequent light showers. However, there was insufficient moisture in it to bring the plant through the ground; hence, unless rain fell within a fortnight or three weeks, grain sown now would probably malt. If the farmer waited for rain, however, and another week elapsed during which the weeds were given an opportunity of growing, seeding would be delayed, so that difficulty would be experienced with the weeds. The farmer, whose seeding operations involved two months' work, should not delay starting after May 1st, and he was well advised to spend a few pounds in hurrying the seed in whilst conditions were favorable. Unpickled seed should be sown in dry soil. Pickled grain was more likely to malt. Grain free from smut sown in dry soil stood less chance of producing a smutty crop than that sown in damp ground. Smut-infected grain should on no account be sown. When damp soil was being sown the wheat should be immersed for two or three minutes in a cask containing a solution of 1lb. bluestone to 10galls. of water. White oats and barley should be pickled in the same manner. Cereals should not be sown to a greater depth than 1in. Wheat on land previously under oats was not liable to be affected with takeall. Cape barley was recommended for feeding off as greenfeed, but rye was preferable when the crop was to be cut. The latter was a faster grower, and cutting did not check its growth, but it did not stand grazing. Crossdrilling, especially for hay or greenfeed, would well repay the extra labor. If this were practised, from

90lbs. to 100lbs. of grain and from 70lbs. to 120lbs. of super. could be used. If drilling one way, from 70lbs. to 80lbs. of seed was sufficient. For hay he preferred Algerian oats cross-drilled with a fairly late variety of wheat, such as Majestic, Marshall's No. 3, Silver King, and Yandilla King. Oats and barley should be sown at the rate of 2bush. per acre if drilled one way, and from 2¼bush. to 3bush. if cross-drilled. Oats were not suitable for greenfeed, as they were inclined to be bitter, were rather slow growing, and did not stand feeding off. Members generally agreed with the ideas of the writer of the paper. Mr. A. Bartrum would pickle all seed, and favored heavier dressings of super. Mr. Ryan would sow 2bush. of seed if cross-drilling. Mr. F. Bartrum favored shallow ploughing, and sowing carefully graded seed.

CANOWIE BELT (Average annual rainfall, 20·04in.).

May 7th.—Present: 12 members and one visitor.

Roseworthy Harvest Report.—A paper was read by Mr. E. W. Noll. He contrasted the weather conditions prevailing at Roseworthy with those of this district, and discussed the methods of cultivation and seeding adopted there, in comparison with the local practice. One hundred pounds of super. and 75lbs. of seed per acre he thought sufficient for hay crops. Mr. Dale thought that, taking into consideration the nature of the season, it was advisable to bury the seed to a considerable depth. He advised the use of the 15 by 7in. drill. The Hon. Secretary (Mr. H. A. Wedding) favored a 15 hoe drill with a harrows attached. Sixty pounds of manure per acre was sufficient for this district.

GEORGETOWN (Average annual rainfall, 18·32in.).

May 16th.—Present: 11 members.

Poultry on the Farm.—Mr. J. C. Myatt read a paper on this subject. The prevailing practice among farmers, he said, was to purchase a few fowls and give these the run of the holding. For the first year or two, although they received practically no attention, they did well, on account of the quantity of feed, grit, &c., they could pick up. However, the flock inbred, tick and foxes became troublesome, and as a result the egg production fell off. He recommended the erection of a galvanized iron house, 18ft. by 7ft. and 6ft. high at the back and 7ft. in the front, which should be open toward the east. Perches should be movable, and scalded occasionally. A netted yard, with a fox-proof gate, should surround the house, and the birds should be let out each morning at sunrise. Young, healthy birds only should be kept, the males being changed every second year. If the fowls had the run of the stables less trouble would be experienced with the bot fly. Table fowls, also, should be reared. The chicks from Wyandottes, Orpingtons, Plymouth Rocks, or Langshan hens, and modern game or Indian game cockerels at 6 months old would net 3s. each. An incubator should be used for hatching. Several members thought farmers could more profitably give their attention to other stock on the farm.

LAURA (Average annual rainfall, 18·22in.)

May 8th.

Pigs—Mr. P. T. Bowker read the following paper :—"Pigs at times certainly are very profitable animals, kept as an adjunct to farming, dairying, or gardening. At times, however, they are subject to a rapid decline in value, and profits disappear. This helps to keep breeders on the alert, for whether to sell or hold the stock is often a knotty problem. It is not our intention to go into the matter of breeds and their history, but sufficient to say that the Berkshire holds the first place in Australia, with the Yorkshire as second. Other tested and good breeds are the Essex and Tamworth, and that famous American breed, the Poland-China, which all do well in our climate, and are all so well known as to need no description here. In planning to add pigs to the farm the question of locality comes first. A piece of land with a northern or eastern slope is this thing for this district, arranged with a view to good draining, and so that the drainings can run on to a lucerne or fodder paddock. Sties facing the north, to admit plenty of sunlight in winter, are best. A handy sty can be made, say 12ft. long by 8ft. wide, with four sheets of 8ft. iron for a roof, with cement concrete floor, costing about £3. This will accommodate six to eight fattening pigs or a sow with litter. It should not be so low as to be too hot in summer. Several small paddocks should be provided, planted with lucerne or any suitable pasture, to give the pigs a change from the sties and as a run for the breeding sows. *The Sow.*—A good deal of care needs to be exercised in choosing a breeding sow; a cross-bred makes a better mother than the pure bred. The Berkshire-Yorkshire cross is a very good one, or Berkshires crossed with Essex, Tamworth, or Poland-China make good sows, and as a rule are hardy and prolific. A long, deep, vigorous animal, with a good appetite, 12 or 14 evenly-placed teats, of a kindly disposition, makes a good type of breeding sow. *The Boar.*—Should be pure bred, of good length and depth, wide, compact, and firmly set on short straight legs of fine bone; should be selected from a large and uniform litter, and should be active and robust. He should have a sty for himself, and should be well fed on good food, but not allowed to become too fat and lazy. Sows after being served do very well in a lucerne or grass paddock and will get most of their own living. A little skim milk, pollard, and grain should be given to keep them in good condition, but do not allow them to become too fat. A week or two before farrowing they should be put in their sty, made comfortable, and fed on moderate food. Successful rearing of young pigs is a difficult task for the farmer, and if he pulls the litter through the first 24 hours he has gone a long way to successful rearing. Half the losses occur soon after birth, unless vigilance is exercised, by the sows lying on the little ones. A sow should not be too fat, and she should not have too much straw or bedding in the sty at farrowing time. A rail around the inside of her stye about 8in. from the walls and 8in. from the floor is a great help in preventing the little ones being crushed against the walls. A week before farrowing some Epsom salts in the food is good, also a little bran and oilcake daily before and after farrowing, often saves a lot of trouble. Do not feed the sow too much after farrowing, but gradually increase the amount as the little pigs grow, give sloppy food and no grain unless well soaked. From 3galls. to 4galls. of skim milk thickened with pollard, with a little oilcake and a pinch of salt, varied with kitchen slops and plenty of green feed such as lucerne, maize, wheat, oats, and grasses make a good ration. At four weeks the suckers began to drink for themselves and should have a trough of their own, and be fed on skim milk, with just a little pollard, increasing the amount as they grow. Soaked wheat or barley should be sprinkled about for them to pick up, also plenty of green feed. With a start like this weaning time at from six to eight weeks old will be no hardship. *Feeding for Bacon.*—After weaning the pigs should be fed right along. With the object of turning them into prime porkers or baconers as soon as possible they should be kept in a clean warm sty and fed with a ration made up of skim milk, also any roots available, pollard, crushed wheat and barley, with a little dry wheat and peas and barley occasionally, and plenty of green feed. If thrifty young pigs, they should at, say four months old, dress at from 100lbs, to 120lbs. and at the present price of pigs, be worth from £2 10s. to £3 each, which should leave a handsome profit over feeding. Although contrary to a lot of practice, cleanliness is important. The sties need cleaning frequently. A good hoseing out, if there is water pressure enough, cannot be beaten. Clean wheaten straw makes good bedding, and is very necessary in the cold weather A shovel of charcoal put in the pen now and again is appreciated by the pig. Change of food is welcome, and a varied ration results in the best growth." He had kept an account of the cost of feeding two Yorkshire-Berkshire cross pigs, which were born on October 25th, weaned on December 26th, and killed on April 26th. During that period the pigs consumed 9½bush. of pollard, costing 9s. 6d.; 6bush. crushed oats, 12s.; 4bush. wheat, 14s.; ½bush. bran, 6d.; and skim milk valued at 2s. The dressed weight of the pigs totalled 250lbs., which at 6d. per pound returned £6 5s. against an expenditure of £1 18s., thus showing a profit of £4 7s. He was convinced that pig raising was a profitable venture, and was worthy of more attention. A most interesting and instructive discussion followed. Mr. R. Cleggett, sen., said the Berkshire sow was the best mother. He advised purity of breed on both sides in crossing. While having tried various other crosses he was convinced that the Essex-Berkshire cross was the best. He had found that all long-nosed pigs were hard feeders. A separate compartment for the feeding of young pigs was advisable. Mr. Blesing said pollard was the best food for sows prior to farrowing. Pollard would increase the milk supply while bran would make fat. His experience had been that a cross-bred mother had proved the best, and he had not had very much success with pure breds. The Essex sow proved a bad mother. Essex were comparatively small eaters, in fact one could fatten three Essex with as much food as it would take to fatten two Berkshires. At the present price ruling for pigs almost any breed would pay. He had found the Poland-China pigs inveterate eaters, and the same applied to the long-nosed variety of Yorkshires. Mr. W. Stevens had met with considerable success by raising pigs from a Berkshire hog and Essex sows. All the speakers expressed their belief in feeding with damp crushed corn. The value of skim and separated milk and its effects upon pigs was also discussed, the general opinion being that while separator milk was good fattening feed discretion should be exercised in the quantity given, especially if given direct from the separator.

LEIGHTON (Average annual rainfall, 16in. to 17in.).

April 3rd.—Present: 13 members and three visitors.

Rib Roller.—Mr. R. McWaters contributed a paper, in which he strongly recommended the use of the rib roller in this district. For the last three seasons, owing to the scanty rainfall, he had gone over with the plain roller a considerable portion of the land intended for sowing. Some portions of the land became so tight after the rain that the wheat did not come up, and in other portions hard clods had been forced into the ground. The rib roller left the ground in a very uniform condition. He was convinced that if he had rolled all the land under crop last year he would have had a much heavier yield. The implement was very useful for loosening the soil round the roots of tussocks, which were usually very troublesome. By rolling the land and then harrowing, most of the tussocks were gathered with little trouble.

LEIGHTON (Average annual rainfall, 16in. to 17in.).

May 11th.—Present: 16 members and one visitor.

Pickling Wheat.—It was thought wise to pickle wheat only so far ahead of sowing as would ensure free running through the drill. The strength of solution recommended was 1 per cent. (1lb. bluestone to 10galls. water).

The Agricultural Bureau.—Mr. R. Humphrys read a paper dealing with the advantages of the Agricultural Bureau system, mentioning it as an excellent educational medium. He advised steps to increase the membership of the Branch, and urged the necessity for loyal support on behalf of members.

MOUNT BRYAN (Average annual rainfall, 15·81in.).

May 4th.—Present: eight members.

Seeding.—Mr. J. Trallagan read a paper. It was necessary, he said, to procure the wheat most suitable for the ground in which it was to be sown. For limestone soil Dart's Imperial, Marshall's No. 3, Yandilla King, and Purple or Red straw were recommended for grain or hay. Early Para and Majestic, whilst yielding lighter grain returns, made hay of superior quality. For heavier and richer soils he recommended Federation, Marshall's No. 3, Purple straw, and Yandilla King. The seed should be pickled in a solution of 2½lbs. bluestone, 3ozs. lime, and 5galls. water, which would provide sufficient to treat 20bush. If the seed were being sown on fallow prior to rain, the roller should precede the drill and the land should in no case be left solid or lumpy. On light limestone soil, or stubble, the scarifier or cultivator should be used. For seeding on clean land he would use not less than 60lbs. of wheat per acre. The drilling should run north and south, thus protecting the crop against the high westerly winds. After the wheat was well above ground it was an advantage to go over it with light harrows.

NORTH BUNDALEER.

May 6th.—Present: 11 members and three visitors.

Lime.—Mr. Smart said some of the lighter soil in this district was deficient in lime, which, if applied, would encourage the growth of clover and natural grasses, and so introduce nitrogen into the soil, of which it was deficient. Mr. Jas. Pollard did not think nitrogen could be got into the soil through grasses; a crop such as peas was much better, as then a sufficient number of sheep per acre could be kept on the land, and sheep manure was rich in nitrogen. Lime would flocculate the soil and keep it mellow. In many places in this district there was an abundance of carbonate of lime which could be used. Distributors could be procured to do the work of spreading.

PORT BROUGHTON (Average annual rainfall, 14·44in.).

May 15th.—Present: seven members and one visitor.

Co-operative State-Assisted Experimental Farms.—Under this title, Mr. Whittaker contributed a paper, in which he suggested that 25 farmers should be selected in different parts of the State to conduct experiments on their own farms. Each farmer should receive £200 per annum, together with seed and super., the farmer supplying labor, horses, implements, &c. The total cost of this scheme, including supervision, would not be above £7,500 per year, which would be amply repaid in the course of a few years to the State. The proposal applied more particularly to new land. Mr. Hill thought the idea well worth consideration. Mr. Dolling opposed the scheme, and Mr. A. J. Fletcher thought the scheme formulated at the Congress of Agricultural Bureaus at the last September Congress would be more effective. Mr. Vanstone, the Chairman (Mr. T. E. Pattingale), and the Hon. Secretary (Mr. J. H. Fletcher) thought the scheme would be of no value in the settled districts, although it might be of use in the new country.

PORT PIRIE (Average annual rainfall, 13·21in.).

May 9th.—Present: nine members.

Conservation of Fodder.—Mr. W. Munday read a paper on this subject. As much of the agricultural and pastoral land in South Australia was in the comparatively dry zone, it was necessary for the farmer who would guard against the loss of stock in the dry years to go in systematically for the conservation of fodder. Most of the losses which had been experienced might have been avoided had such methods been adopted. The very luxuriant growth in good years was a big temptation to landholders to overstock, and this was the explanation of their being left with bare paddocks and a large number of stock on hand when the dry years occurred. He suggested that farmers should plant the stubbles with oats or barley, or with a mixture of both, adding a little rape. Later, sorghum could be sown if the conditions were favorable. He believed in planting summer crops earlier in the spring than was often the practice. In the good seasons quantities of hay should be stored, well thatched and protected from mice. By the adoption of such practices as he had outlined he had been able to tide over the worst drought experienced, and had often been able to supply dry fodder in bad years to his neighbors. If farmers in similar country would order their practice somewhat in this manner, the results would bring them great satisfaction, and their incomes would be materially augmented. Mr. Welch thought more could and should be done in years of plenty in the way of storing sufficient fodder to tide over dry seasons. Mr. Eagle believed in having at least two years' supply of hay on hand. Mr. Greig deprecated the practice of overstocking.

REDHILL (average annual rainfall, 16·79in.).

May 22nd.—Present: 12 members and four visitors.

Poultry on the Farm.—A paper dealing with this subject was read, in which attention was drawn to the negligence on the part of many farmers to provide suitable accommodation for their fowls. Iron houses were recommended, and the paper continued—"These can have some straw thrown in and burned, which is the easiest way to kill vermin. Failing all iron, I suggest wood and iron closed in on three sides, with plenty of ventilation but no draught. Perches should be hung from the roof by wire with kerosine rags wrapped round. Wet the rag about once a week and no vermin will cross it. Care must be taken to see that no perches touch the wall. Erect lower perches from the ground so that the fowls can get up to the top without having to fly. The chickens will roost earlier if they can get up in this way. All perches can be of iron in a warm district like this. Old piping is very suitable. Clean the house occasionally to keep down the vermin. Build it in a sheltered spot, if possible, to protect the birds from cold, especially east, wind. A few trees or shrubs make a good breakwind. Give them plenty of room. Provide a fox-proof yard, putting the netting in ground about 6in. The birds should be fed regularly, morning and night. About one hour before sundown is about the best time for the evening meal, which should be of corn. The best results are got from using good mixed corn, not damaged, weevily, musty stuff, which is bound to tell on the birds. In the winter a warm meal of boiled wheat, barley, oats, mixed with a little mustard is relished. In the summer months a bran mash two or three times a week keeps the fowls in good health when green-feed is scarce. The farmer's fowls generally run at large and do not require so much attention, as they will find grit, lime, &c., for themselves. The drinking vessels should be kept clean and in a cool place. It is advisable to clean the vessels once a week with a strong solution of Condy's crystals, and a little added to the drinking water keeps it pure. This will be found the best preventive for all diseases of fowls. Nests should be made in a sheltered place, and the litter in them changed once in a while. The chicks should be hatched as early as possible in April, May, and June, to get winter layers, as eggs are always a good price at that time. I would advise an incubator if the farmer has the time to look after it; but the trouble is rearing the chicks after they are hatched with the machine. They need care for the first few days. Keep them in a coop with plenty of dry litter. They do not require any food for at least 24 hours after they are hatched. Stale bread crumbs with some crushed grain is the best for the first day or two. Have plenty of grit available. Keep water in shallow vessels or they will get in it and get cramped or drowned. Feed several times a day till they are able to look after themselves. I would not recommend any man to have one strain only, as they frequently become delicate owing to inbreeding. All young cockerels should be penned, fattened, and sold as soon as they are big enough; only keep those required for stud purposes. The hens will not lay if they are worried by a lot of young cockerels. Hens should be penned up as soon as they become broody, and not left on the nest a week and then shut up. I recommend getting a fresh rooster every season. It is better to pay a good price to a well-known breeder for a rooster than keep one bred on the farm. There should always be pure blood on the roosters' side. Whatever breed one goes in for it is best to keep on introducing fresh blood, and in a year or two a good hardy flock will be secured." Mr. F. A. Wheaton agreed that iron roosts were preferable. Mr. W. Pengilly thought fowls should not roam at large, owing to the damage they did to machinery, &c. Some members favored purebred fowls, whilst others thought the crossed fowls were more healthy.

SPALDING (Average annual rainfall, 20·25in.)

May 15th.—Present: 11 members and one visitor.

Pickling Wheat.—Mr. J. H. Pluckrose dealt with this subject in a paper. He thought it wise to pickle in a weak solution of bluestone (*i.e.*, 1lb. to 10galls. of water) all the wheat intended for seed. Grain from a smutty crop should not be sown, even if pickled. A strong solution of pickle would impair the germination of the seed. The bluestone could be dissolved by being enclosed in a hessian bag, and suspended half in the water. The grain, in butts, should be immersed in the pickle for three minutes, and vigorously shaken, so that every grain became wet. The solution should drain back into the cask after the wheat was taken out; the grain should be sown the following day. The paper continued: "Mr. Ross, Chief Inspector of Agriculture in New South Wales, says that 'the action of bluestone while pickling has the power to impair the vitality of the grain, and even to kill the germ.' To guard against this the following measures should be observed:—If there is no prospect of immediate germination, that is, if a dry sowing is made, the bluestone wheat should, after having been allowed to drain for 10 or 15 minutes, be dipped into a solution of limewater, which is made by stirring ½lb. of freshly-burnt lime into 10galls. of water. This mixture is allowed to settle, then the clear lime water is decanted, and into this the bluestone-treated seed is dipped for from two to three minutes. The lime neutralises the effect of the bluestone, and so preserves the full vitality of the wheat germ. If, on the other hand, a 'wet' sowing is made and an immediate germination of seed is likely to follow there is little need to dip the bluestoned wheat into lime water. Should it be found impossible to obtain freshly-burnt lime, it is recommended that ½lb. of slaked lime be mixed with 10galls. water, thus making milk of lime, into which the butts of the bluestoned wheat should be dipped for a period of two or three minutes. Milk of lime differs from lime water in so far that in the former the particles of lime are not dissolved, but held in suspension, whereas in the case of clear lime water the particles are dissolved. When using lime water care should be taken to make a fresh mixture now and again, as the constant dipping of the bluestone saturated butts of wheat into the lime water will change this eventually from an alkaline into an acid solution, in which state it would be useless, For that reason bluestone and lime should never be mixed together in a solution used for pickling wheat. The chief advantage gained from using lime water in addition to bluestone are—Firstly, that a farmer following this practice is in a position to pickle all his seed wheat in March ready for sowing in April and May, without running any risk of the germination being affected; secondly, that a better germination will be obtained if the sown seed should lie in the ground some time before rain falls and germination takes place. Little extra trouble is involved in the bluestone-lime treatment, and farmers are strongly advised to adopt this method in preference to the bluestone treatment only. A method I would not recommend is placing a full bag of wheat in the pickle, as I have opened bags thus treated and found that some of the grains have not come in contact with the solution at all." Members preferred dipping the grain to floor pickling, but in lesser quantities than a bag of wheat at a time. A perforated copper cylinder was the best to hold the wheat during pickling. Mr. Jones thought bluestone more satisfactory than formalin. He pickled white oats, but not the brown varieties. Mr. Hacklin recommended 1lb. of bluestone to 10galls. of water, the grain being treated some time before it was sown.

WHYTE-YARCOWIE (Average annual rainfall, 13·91in.).

April 18th.—Present: 12 members.

Farm Management.—The following paper was read by Mr. E. F. Pearce:—"*Fallowing.*—Fallowing is the first job to which the farmer turns his attention. This should be commenced as early as possible after the first winter rains, when the ground is in a nice soft condition. The average depth to which most farmers plough their land is from 3in. to 4in., and they get into the habit of doing this year after year. This is foolish, as the land just below the depth the plough turns up gradually becomes beaten into a solid crust, into which the roots of plants find it hard to force their way, and in consequence the plants suffer. It will be found a much better plan to vary the depth of the ploughing year after year, thus lessening the tendency of the ground to set down. If possible, get the fallowing done by the end of August, as land fallowed later does not get the benefit of the heavy winter rains, which help to break down the rough surface of the soil, and also cause vegetable matter to decay more rapidly and form humus in the soil. The main objects in working the land are to conserve moisture and to destroy weeds; therefore the system of working that will retain most moisture in the land and cause weeds to grow is the system which should be carried out. Harrowing down the fallow is a great factor in the conservation of moisture. The harrows should be got to work as soon as the fallowing is finished, or better still, an extra team should be put on to do the harrowing as the ground is ploughed. After the ground has been worked down well, and the weeds have started to grow, the cultivator should be brought into requisition. Care should be taken in the selection of this implement, as it is of great importance that it should destroy as many weeds as possible, and yet leave the surface fine and level. The skim plough seems to be the best implement for this work, both as a weed killer and also a land leveller. If good rains fall in the summer or early autumn it will be found profitable to harrow the fallow again, because a certain amount of moisture will be kept down, and also, the seeds lying on the surface will be buried, when they can germinate and be killed during seeding time. It is a good practice to work up any dirty land that it is intended to fallow in the slack time after harvest and before seeding time. This will be found the best way in which to get weeds to grow. Seeding operations should not be delayed too long, neither should they when once started be allowed to drag out for any longer than can be helped, otherwise one will run the fallowing too late, and lose more by that than is gained by late sowing. When drilling be very careful not to bury the seed too deeply, especially in ground which is inclined to set or run together. It will pay better to risk leaving a little grain on the surface. *Stock.*—One of the many duties of the farm manager is to see that his stock are well looked after, for a farm is not half managed when the stock are allowed to go just anyhow. The horse is entitled to the best of care, not only because of its value, but because of the greater usefulness of a well cared for animal. A good stable and yard are absolutely necessary if one is going to keep horses up to the mark. No horse will do well if it has to feed out in the open in the cold weather, or if it is kept in a draughty, badly ventilated stable. When a horse is working hard it should be fed three times a day. The morning feed should consist of from 8lbs. to 10lbs. of good hay chaff. If there is very little grain in the chaff it will pay to add a small amount. The mid-day meal should consist of from 6lbs. to 8lbs. of good hay chaff, to which has been added a fair allowance of grain, preferably crushed oats or bran. If good hay, not too rank, is available, feed long hay at night, and sufficient should be given just so that the horse can clean it up before morning. If chaff is given at night the horses are inclined to eat it too fast. The horse should be groomed once a day when working, to remove the dirt and dried sweat from its body. The stables should be kept clean and dry. *Sheep.*—Next to wheat-growing come sheep as the most profitable activity for the farmer. Upon his management depends largely the profit he will make out of them. The best all-round sheep is the Merino. Whatever deficiency there may be in the carcass is fully compensated for in the value of the wool. For lamb-raising, the ewes' lambing season should be over before the cold weather sets in. At the price sheep are now and the prospect of good prices for some time to come, it is wise to seriously consider the subject of hand-feeding sheep. A paddock of fairly good feed should be kept back, on which to put the ewes and lambs during the lambing season and for a few weeks afterwards. The paddock should have some warm sheltered places, wherein the ewes can camp in the cold weather; but it should not be too large, or the ewes will lose their lambs when they are travelling across it. Choose a fine warm day during a period in which the weather is likely to hold fine for a week or so in which to tail the lambs. If it comes wet and cold just after the operation the lambs are bound to suffer much more than they otherwise would. The knife will be found to give better results than the searing iron, besides being a much simpler and quicker method. The knife should be wiped on a rag which has been soaked in some antiseptic. This precaution, if resorted to after every three or four lambs have been tailed, will minimise the risk of blood-poisoning. Sow a few acres to some fodder plant, on which to top up the lambs for the market in the spring. Do not keep any old broken-mouthed sheep on the place. Fatten and sell them before their teeth get too bad and make it impossible for them to get in good condition. *Farm Buildings.*—One of the main aspirations of the present day farmer is to have a homestead of which he can be proud. One thing which needs very careful consideration is the choice of a site on which to erect the farm buildings. Many farmers seem to have got hold of the idea that any useless piece of ground is good enough on which to make their homestead. No greater mistake can be made than to place the homestead in a bad position or on a poor piece of land. The ideal spot is on a piece of good rising ground or on the slope of a rich hillside. Of course, a person must consider his chances of getting a good well of water, without which no homestead is complete. Nothing beautifies a place more, or provides such shelter for stock than a good plantation of trees; therefore pay attention to tree-planting. One mistake noticeable in many homesteads is that the rubbish and manure from around the stables and sheds blows directly in and around the doors. This rubbish spoils the appearance of a place very greatly, besides causing much trouble and inconvenience to those who have charge of the home. All this trouble need never be if the one responsible for the laying out of the homestead would exercise a little judgment and forethought. The barn and the machine sheds also should be placed so that rubbish cannot blow in and about them. A position between the house and the stables will suit them if no better can be found. Do not bunch the buildings together more than can be helped, but keep the stables, pigsties, and so forth well back from the house, say, not closer than three or four chains. In all departments of farm management the farmer must experiment and take note of what he hears, sees, and does, and prove for himself what will best suit his peculiar conditions. In this way, and in this way only, can he hope to be successful." This paper was well received, and members generally agreed with the writer. There was some difference of opinion as to deep and shallow drilling. Mr. Hunt favored deep, and gave an instance from last season, when a deeply-drilled piece germinated better and maintained the advantage throughout the season, and gave the best results at harvest. Some other members thought that much depended on the nature of the soil and the season. Last season was exceptional, owing to heavy rains in the early part of March, followed by an exceptionally dry winter. Members were also at variance with the writer in reference to early lambing. The Chairman (Mr. G. F. Jenkins) and Hon. Secretary (Mr. E. J. Pearce) both thought the middle of April to the middle of May safer in this district, although last season, owing to early autumn rains, the early lambs came out well. Members were agreed that it was well in laying out a new homestead to study situation, soil, and water supply, and even if unable to straight away erect up-to-date improvements, to have an up-to-date plan in mind that could be worked out as opportunity and means allowed.

WHYTE-YARCOWIE (Average annual rainfall, 13·91in.).

May 11th.—Present: 11 members and one visitor.

THE FARM HOMESTEAD.—The Chairman (Mr. G. F. Jenkins) read a paper, as follows:—"Whatever the character of the first house may be, even if it is only a tin hut, care should be taken in the selection of the site, as, naturally, the farm buildings will grow around the first home. One cannot lay down any hard and fast rule for the building of the homestead, as much depends on circumstances, water supply, &c. If it is possible, however, the house should be on rising ground, in order that there may be a natural drainage. For the home itself, if one makes a start with a two-roomed house it is just as well to look a little ahead and build them so that they may be added to without spoiling the appearance of the house from an architectural standpoint. Indeed, no matter what size the house may be, it should not be only a roof over one's head, but a home in reality. I fail to see why so many farmers should be content with any sort of a home in the country, but if they should retire to town to live later on the best house in the street is required. Personally, I should like to see the farmhouses of this country reflect the prosperity of their owners; and if farmers would endeavor to make their homesteads as attractive as possible an added charm would be given to the farm and to country life generally. Having selected the site for the house, an equal thought should be given to laying out the farm buildings. These should be placed well away from the house, and always at the back. Nothing spoils the appearance of a well-built farmhouse as much as a lot of unsightly sheds built about the front and sides of the home. It is well to keep the farm buildings together, and as compact as possible. The stables should be built of stone, if circumstances will permit, and should be constructed so that the horses may be fed with as little labor as possible. If the stable is built to allow for a run, say 5ft. wide, at the back of the manger, leading into the chaff house at one end there will be very little inconvenience or danger of being kicked when feeding the horses. The hay yard should be immediately behind the stable and enclosed with a stone wall at least 4ft. 6in. high—the most efficient firebreak possible. If the barn is constructed with an entrance at both front and back, and preferably with a gable roof, a leanto on either side will provide good implement sheds blacksmith's shop, &c. A good plan for the implement shed is to have sliding doors working past one another in the front of the shed, so that implements can be put in or out with the least possible inconvenience. As time and circumstances permit trees should be planted to beautify the home and provide shelter from the high winds that prevail on these northern plains, as well as being a useful shelter for stock. What could be more attractive than an avenue of beautiful shady trees leading from the entrance gate to the homestead, while plantations planted between the house and the stables would serve to hide these buildings from sight of the house and also prevent dust from blowing from about the yards to the homestead. Care should be taken, however, not to plant trees too close to the house or garden, as they are great robbers of moisture, and it is almost impossible to get flowers or vegetables to thrive within a chain of a row of gum trees. I am sure that a little trouble and foresight used in laying out and beautifying the home would be more than repaid by the additional comfort enjoyed by the owner, while such would materially add to the attractiveness of farm life to the younger generation. The country homes of Australia should rival in attractiveness the city and suburban residences." In the discussion, Mr. Wittwer said the homestead should, if possible, be centrally situated, for convenience of working the farm. He had seen straw roofs on stables with wire netting under and over; this prevented the wind raising the straw and the nesting and scratching of sparrows and domestic poultry, which destroyed the roof. Mr. Hunt preferred straw to iron as a material for the stable roof. It was cooler in summer and warmer in winter, and if properly put on would last a long time. Mr. McGregor preferred iron. All things considered, he had found it a difficult matter to maintain a good straw roof. Many farmers had purchased their farms already improved, and could not afford to discard the structures already in existence, although they were unsatisfactory, and in some instances an eye-sore. Mr. G. W. Mudge said even when the pioneer farmer had the chance to select a site and lay out the improvements he seemed to select the spot on which he happened to camp the first night, or in some equally haphazard way make his selection. He agreed with Mr. Wittwer that it was advisable to have the homestead centrally situated, not only for convenience of working, but to avoid trouble with neighbors through pigs, turkeys, &c., trespassing on neighbors' property. The Hon. Secretary (Mr. E. J. Pearce) had seen costly residences erected on farms, which in a few years became actual encumbrances, when (consequent on the sons wishing to set up for themselves) the property needed to be subdivided. He was, however, in entire agreement with the writer when he said the farmer should set out to make a home in the best sense, not merely a shelter from the weather. In reply, the writer of the paper said he would not have a straw roof for a stable, much preferring iron. If proper provision were made for ventilation it would not be too hot in summer. It was permanent, and in appearance and every other way more desirable. He emphasised the statement made in the paper that he did not advocate large houses, but well designed, tasteful, and homelike structures, whether of two rooms or 10. If more well-to-do farmers built nice homesteads in the country instead of retiring to the city the country would reflect the prosperity which rightly belonged to it

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YONGALA VALE (Average annual rainfall, 13in. to 14in.).

May 9th.—Present: 12 members.

Seed Wheat.—Mr. T. H. Battersby read a short paper. The farmer should sow nothing but the very best and cleanest wheat for seed, he said. It would be found payable for each farmer to sow two or three 5-acre plots of varieties specially for seed. When these had grown to about a foot in height, they could be handweeded, and when the grain was out in ear and just beginning to turn yellow strangers could be picked. Members considered the introduction of seed plots and hand-picking a step in the right direction. Some thought it better to pick a bushel of the best heads of each variety for seed.

BEAUFORT, May 7th.—An interesting and instructive report of the proceedings of the conference of Northern Yorke Peninsula Branches was delivered by the Branches' delegate, Mr. J. Sampson. Special reference was made to the excellent work being done by Mr. F. Coleman, of Saddleworth, in connection with the improvement of wheat.

MOUNT BRYAN EAST, May 14th.—A paper dealing with bacon-curing was read by the Chairman (Mr. J. Thomas), who also read an article by Professor Ewart, dealing with the effect of trees on rainfall. It was reported that good rains had been experienced, which had started the grass well, and the prospects of the season were bright.

PORT PIRIE, April 4th.—Mr. A. Bond read a paper on "How to Beautify the Home and make Farm Life Attractive." He advocated planting trees for shelter and ornamental purposes. Vegetables should be grown if sufficient water were available. A small garden well cared for was preferable to a larger area neglected. Mr. F. Johns thought it would be difficult to secure sufficient water for a garden on most farms in the district. Gums, and such like trees, should not be planted too near a garden. Mr. Welch and the Chairman (Mr. D. L. McEwin) also spoke.

REDHILL, April 24th.—Mr. M. Coffey delivered an address dealing with the aims and objects of the Agricultural Bureau.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16·46in.)

May 2nd.—Present: 27 members and five visitors.

Spring or Bridle Draught in Ploughs, Etc.—A short paper was read by Mr. E. Lehmann. He thought the spring draught better for a plough or cultivator, as with it the implement worked to a more uniform depth. When the spring was directly over the body it held the share more firmly, and was less likely to miss weeds. There was less jarring on the horses' shoulders, and as each body jumped independently there was less likelihood of the implement becoming hung up in stumps. He urged the wisdom of Branches conducting field trials.

CLARE (Average annual rainfall, 24·30in.).

April 10th.—Present: 21 members.

Well-Sinking.—Mr. F. G. Hicks read a paper. After selecting the site for the well, he said, a collar set, say 6ft. by 3ft. by 6in., should be placed in position, and side pieces 10ft. or 11ft. long would be required. One side should be dressed up with bush timber, as straight as possible. With an adze or broad axe sufficient 5ft. or 6ft. sets should be cut to log up the brace and provide a good tip for the soil. After fixing the windlass, sinking could be commenced. If the proposed well were circular, two stout nails should be driven into the collar set, 3ft. 6in. or 4ft. apart, according to the size of the well. The circle should be described from these after sinking a few feet. A plumb-bob should be hung on each nail, and lowered as sinking progressed. With a square well the plumb-bobs should be hung in each corner, but on no account should a well be sunk without those. The sides should be trimmed with a pick, and not a shovel. A square or oblong well was preferable, as, if bad ground were struck, it was easier to secure. If the ground were bad for standing, square sets of 6in. by 6in. timber should be put in at every 4ft., 6in. by 1½in. laths being placed behind. If the well were in drift sand, or running ground, every square set should be hung from the collar set with iron rods, cut to the required length, and key-hole punched either end; the keys to be about 1in. by 3in. by ⅜in. In running ground a bridge should be put at the back of each square set, by placing a lath 3in. wide at the back thereof, and wedging it back about 3in. In very bad ground the laths should be kept driven well down below the bottom of the well. When about 2ft. or 2ft. 6in. below the bottom of the lowest square set, a false set, wider than the permanent sets, should be put in. This was to catch the ends of the laths, so that there would be ample room for the next permanent set. When sinking in hard ground a round well should never be attempted, nor should the well be commenced too small, *i.e.*, less than 7ft. by 4ft. A larger well gave more room in which to work, and a better lift for blasts. When the ground was fairly bad for a certain distance, good deep hitches should be cut out, a bearing set put in, and the bad ground timbered up from this; 8in. by 2in. sawn timber would be found most suitable. In very hard ground it was advisable to cut hitches every 8ft. or 10ft. to carry bearers, in case a pump were eventually placed in the well. When it was intended to deepen a round well properly bricked up on an iron ring, if it were rather small in which to work, hitches should be cut under the ring with a short-handled, single-ended pick. Into these 4in. by 4in. stringy or jarrah bearers should be worked, a hole being bored in each end of the bearers close to the walls, and the bearers hung to the collar set with ¾in. iron rods, or stout wire rope. Provided the bricks had been properly packed in the first place, the weight on the bearers would not be very great. After sinking, if storage room were required, a drive 7ft. by 4ft. could be put in at the bottom. If the ground were bad for standing it could be timbered with bush timber. Mr. Elliott stated that if a person wished to sink a bricked-up well deeper it was quite safe for him to do so, providing the bricks were laid properly, and the usual precautions were taken. In reply to questions, Mr. Hicks stated that timber was preferable to bricks for building up a well. He considered that slabs were the cheapest timber to use for a shallow well, but would advise using square sets for a deep well. A bow-line knot was safest to use on a rope for lowering an amateur down a well. To find out whether there was foul air in a well he would drop into it a piece of lighted paper. If it went out he would not go down. To get the foul air out he advised using a wind-sail. He did not believe in the divining rod for finding water, which opinion was shared by Mr. Sincock. Mr. Pattullo and Mr. J. Maynard both believed in the divining rod, and gave instances where it was used successfully to locate underground springs.

Blasting Powder.—The following paper was read by Mr. E. L. Elliott at the March meeting:—"Blasting powder is used mostly for splitting timber, removing stumps, and quarrying stone for road metal and building purposes, and for excavating work. Of late years powder has also been extensively used in orchards and vineyards. It must be kept perfectly dry, and handled with great care. When using blasting powder it is necessary to have the bore-hole dry and clean. To explode the charge no dynamite is necessary; simply cut the fuse a little on the slant and insert it into the charge, add a little more powder, and then the tamping, which should consist of fine sand or dry clay. This should be tamped down very firmly. Sometimes a charge will miss fire. Do not approach the hole for 20 minutes, and if it is 5ft. or more deep give more time. To extract the charge, bore out the tamping in the same way as when boring the hole, using plenty of water, and when the tamping is nearly all out let the charge soak for a while, and then jump lightly and slowly. The charge will come up black, like ink. When this is completed, dry out the hole thoroughly, recharge, and fire. The powder tamping rod should be made of wood, but after the powder is tamped an iron rod with a copper end should be used. The copper end is to prevent sparking."

LYNDOCH (Average annual rainfall, 23·01in.).

May 7th.—Present: 19 members and one visitor.

Manuring Fruit Trees.—The Hon. Secretary reported having in 1913 applied to one acre of peach trees and one acre of apple trees, 2cwts. bonedust and 1cwt. sulphate potash per acre. These dressings were applied in May and ploughed down. In September ¾cwt. of sulphate ammonia per acre was added and harrowed in. The results so far were very disappointing. The peaches on the manured trees were inferior to those on the unmanured. The apples were no better than elsewhere in the orchard, where no manure was applied. The rainfall for the season, from May to April, was the lowest on record. Mr. F. Moore had for several seasons past used lime ash amongst his fruit trees, at the rate of 5cwts. per acre. The cost of same was 10s. 2d. per ton landed in his shed. The lime ash was spread with shovels from the back of a dray and thus a thin coating was evenly distributed over the orchard. He used 7 tons each season. Two men spread the ash in three days. The orchard was then ploughed. This was the only manure he had used for several years. The growth of the trees Mr. Moore considered equal to anything in the district. The fruiting powers had been liberally exerted for the last few years. He recommended all orchardists whose ground was either heavy or sour to try a liberal dressing of lime, as since he had been using lime ash he had succeeded in eradicating sorrel, which had for years almost complete control of the soil. Other members had little or no experience in use of artificial manures. Mr. H. Springbett preferred subsoiling with gelignite to applications of artificial manures.

MALLALA (Average annual rainfall, 16·88in.).

May 4th.—Present: 13 members.

Trees for Shade, Ornament, and Fruit.—Mr. J. Arnold read the following paper:—"I put ornamental trees first for two reasons, because here, on the plains, a fruit garden cannot be successfully grown without the shelter afforded by a belt of gums or other suitable trees, and because of the permanent and effective supply of firewood they yield. Trees for a windbreak shelter should be planted all around the fruit garden, if possible, but on the west and north sides they are necessary to success. I have seen gardens in my district without any shelter, and although the trees grew apparently as well as in sheltered gardens, there was very rarely the same quantity or quality of fruit on them, as the rough winds damaged the buds, flowers, and fruit. I would plant at least eight or nine rows, and, if possible, more on the north and west sides, and perhaps less on the other sides. It is rarely that the east winds affect the trees, but I have occasionally experienced an easterly blow that has laid my apples and pears on the ground. I would plant principally sugar gums for clayey soils and South Australian blue gums for rubbly soils for the outsides or plantations. The inner rows next the fruit trees should be carob, tamarisk, tagasaste, kurrajong, almonds, &c. Gums are great robbers, and should not be planted within, at least 40ft. of fruit trees, and so two or three rows should be planted between with the above-mentioned non-robbing varieties. I would plant gums about 12ft. apart—roughly 300 per acre. The shelter trees should be planted about one or two years before the fruit trees, to keep ahead and provide shelter as the fruits grow. Sugar gums are ready to cut down for firewood from about seven years onward, and make really good kitchen wood, which burns bright and free and does not smoulder and char as the matured gum does. It is very hard to chop, and should be sawn, if possible. I have cut the sugar gum at all heights, but think that nearly level with the ground has given the best results. The second growth will come much more quickly than the first, and will usually make two or three stems, so that the value of the plantation—from a firewood point of view—is yearly increasing. Sugar gums should be cut down, even if not wanted for firewood, to keep them free growing and bushy. A good plan is to cut, say the outside and centre rows right through when the trees are about seven years old, and the next year cut the rows inside those cut last year, and so on year after year, thus giving you a plantation in all stages of growth, and making a much better windbreak than the usual plantations of gaunt bare gums. Aleppo and Remarkable pines make a very pretty plantation and a splendid break, but are very slow of growth and do not grow after being cut down. Gums should be planted in August or late in July on good, deeply-worked fallow, and should be worked with a cultivator continuously, both winter and summer for about three years, or until the trees are big enough to kill all grass around them. If worked in the driest part of the summer the trees will at once put on extra growth. About four acres, or about 1,200 trees, will keep a farm homestead in firewood permanently; also a lot of handy rails, &c., can be cut from the plantation. The trees can be procured from the various Government nurseries on application, free of charge. Get plants in bamboo tubes or in pots. I have had the best results with the tube plants. I have bought the seed and reared gums in old pots and jam tins, but this involves considerable trouble, and I would not advise it. For the fruit garden I would plant 70 trees, which would be sufficient for an ordinary farm homestead's requirements and to spare. But as a few extra trees make very little difference when working a garden with a horse and cultivator, it is better to have sufficient, and also there is always a ready sale for fruit here. I would plant the following varieties and quantities:—Six apricots (three Oullin's Early and three Moorpark), six peaches (one Foster, two Elbertas, and two good early, and one good late variety), six apples, three pears, four plums (one American Cherry, one Greengage, and two Japanese), two loquats, one mulberry, four quinces, one walnut, two cherries, three figs, and 12 almonds—costing about 48s. I would complete the 70 trees with 20 oranges and lemons, which do fairly well about here, if planted on any soil except very stiff red clay. Those would cost about 50s. The fruit trees should be planted in July, and will be very little trouble to start if it should be a normal rainfall year. It is a good plan to water the trees during the first year. I would also plant 50 vines, a judicious selection of which, beginning with Green's Early and currants and ending with Doradillas and Wortley Halls, gives a ripening range of nearly four months. These would cost about 12s. to 15s. I would plant a lawn in front of the house. Buffalo grass is the best. Secure it unmixed with the couch grass, as the latter is one of the worst pests that can be introduced into a garden. There is almost an unlimited variety of roses and shrubs that look well around the house and lawn and between the lawn in front and the hedge. Some of the prettiest and best are Oleander, Wigandia, Hibiscus, Lauristinus, Jacaranda, brooms, bush roses, &c. I would, in laying out a garden and grounds, follow roughly the following plan:—Plant a lawn in front of the house and plant shrubs and standard roses around the house and lawn; also some flower garden, and not forgetting the homely kitchen garden at the back. Outside that, on both sides and the back, I would plant the fruit trees and vines. Always remembering to put the softest fruits closest in, to afford them more protection from birds. Outside that a few rows of non-robbing trees, and then the big plantation of gums. All farmers should at least grow enough timber for firewood. The State supplies the young trees (forest and ornamental) free of cost, and that and the other advantages far outweigh the trouble of planting and the three years' working. Farmers should also grow all their own fruit and vegetables. With Barossa water fruit will grow in any part of this district; and as nearly every landholder about here has water laid on he need have no fear of the result. Considering our climate, rainfall, and soil it is a great pity that there are so many bare farm homesteads in South Australia. I do not think that it is a want of taste, or apathy, on the part of the farmers, but rather a failure to grasp the possibilities of our wonderful country. I have been growing firewood sufficient for our own use on about three acres of gums, and also more than sufficient fruit on about 60 trees. I have found it a pleasure and have been amply repaid for my work."

NANTAWARRA (Average annual rainfall, 15·90in.).

May 7th.—Present: nine members.

The Blacksmith's Shop.—A blacksmith's shop on the farm, Mr. T. Dixon said, in a short paper, would enable the farmer to considerably reduce working expenses. The necessary fittings were bellows, a forge (which could be made from part of a 400gall. tank), anvil, and cutter, 10lb. hammer, 2lb. hammer, and several pairs of tongs of different shapes. A drilling machine and bits, stock and dies, taps, would be wanted, together with chisels and punches, which could be made in spare time. Handy sizes of iron, bolts, nuts, and coal should be kept on hand. This outfit would enable the farmer to draw out his plough shares, make swings, eyebolts and rings, S and C hooks, and many other small requirements. Too much time, however, should not be spent in the shop; all that was necessary could be done on wet days. Mr. E. J. Herbert strongly favored a blacksmith shop on the farm. Some of the jobs, however, were not as easy as they appeared, and a good deal of the rough and unsatisfactory work was due to not having the fire in a fit state before commencing. By not attending to small breakages, &c., and getting them repaired at once when they occurred, neglect often led to greater inconvenience. With a small shop handy this need not be, and for the same reason he did not agree with the paper in leaving the work for a wet day. Mr. Sleep considered a small blacksmith shop a great saver of time in case of small breakages, &c. He concurred with the previous speaker that the fire should receive proper attention before starting. Amateurs should not attempt big repairs, but have them done by skilled labor. Mr. R. D. Nicholls said a blacksmith shop on a farm did not possess all the advantages claimed for it. A great many of the breakages that occurred must be attended to at once and could not be left for spare time or a wet day. The farmer should reckon the cost of making against the purchased article; A great many things, such as bolts, &c., could be bought much cheaper, and a stock of these could be kept on hand. Unless there were someone on a farm whose duty it was to attend to odd jobs he failed to see where the saving of time or money was effected. Mr. A. F. Herbert agreed that it was cheaper to buy bolts, &c., but very often those in stock were too long for requirements, or other small alterations were needed. Mr. R. P. Uppill said that when small breakages occurred he was usually able to proceed with his work by keeping a stock of small accessories, until he could take a number to a tradesman for repairs. Wet days could usually be employed in other ways than blacksmithing. Mr. J. H. Nicholls was dubious about the value of the shop from a monetary point of view. No doubt it was convenient to make little things, and the maker derived a certain amount of satisfaction from his handiwork, but looking at it from a cash standpoint, he considered it cheaper to buy the smaller articles and have the repairs done by a skilled blacksmith. A farmer's opinion on the matter depended a great deal as to whether he was a handy man or not. Mr. Sutton heartily supported the paper. In reply Mr. Dixon said he only advocated doing small jobs in the shop. He favored keeping a stock of small articles, such as bolts, &c., but often a farmer ran out of these or did not have the right size, &c.

NORTHFIELD (Average annual rainfall, 19in.).

May 5th.—Present: five members and one visitor.

Fencing.—Mr. E. W. Kelly read a short paper dealing with fencing. He said all fences should be sheep-proof. A good well-built fence kept one's cattle, &c., from annoying one's neighbors, and in so doing fostered a good feeling. In making such a fence he would use as posts timber (red gum for preference) 7in. x 4in. by 5ft. 9in., with about 2ft. of the post in the ground, with good heavy strainers sunk into the ground about 3ft. The corner posts should be buried 4ft., the posts being from 16ft. to 18ft. apart, and the struts set at an angle of 45°. The wires should be 5in., 10in., 16in., 22in., 31in., and 42in. from the ground, the top two wires to be barbs, viz., 12 x 3 and 14 x 3, drawn through the posts, the holes having been made with 1¼in. bit. Mr. D. Rowe preferred a higher fence, say 4ft. or 4ft. 2in., and did not like too much barbed wire. He thought it better to break a wire or two than injure stock. He would use posts 8in. x 4in. wider apart, say 27ft., with two droppers between. Mr. Eastwood thought it unnecessary to make the fence so high as Mr. Rowe suggested for domestic cattle; inland it might be required, but not in this district. He preferred posts 8in. x 4in., and would put them closer together than was suggested by Mr. Rowe. Mr. J. Williams (Chairman) had done many miles of fencing, and experimented a good deal. He favored a fence about 3ft. 9in. out of the ground, with posts about 27ft. apart, with two T standards between them and strainers every five chains of 10in. the small end and 7ft. long, well strutted. The stability of the fence depended largely upon the kind of strainers and struts and how they were put in. A seven-wire fence was better than a six-wired one. Very few sheep, even crossbreds, got through it or under it. Four barbed wires were not too many, and his experience taught him that cattle and horses had a great respect for barbed wire. For the other wires he found the resist steel, Nos. 10 x 11 or 11 x 12 the cheapest and best he had ever used.

TWO WELLS (Average annual rainfall, 16·36in.).

May 12th.—Present: seven members and four visitors.

Seed Selection.—Mr. A. Pratt gave a report on the results which had attended his 12 years' efforts in selecting wheat with the object of securing a first-class flour-producing grain. The results of his labors had been very satisfactory. After having tried various pickling solutions he had come to the conclusion that the best was salt and bluestone, used from one to two weeks before sowing. His opinion was that formalin would not prevent flag smut.

WATERVALE (Average annual rainfall, 27·17in.).
May 4th.—Present: eight members.

Kangaroo Island.—The Chairman (Mr. E. E. Sobels) gave a very interesting account of a recent trip to Kangaroo Island. He was greatly impressed with the island, which he considered had great possibilities. There was land there, he believed, that if it were on the mainland would be worth £20 an acre, but there was other that was not worth 2s. an acre. He saw fruit of an excellent sample and flavor. The timber was very fine, and better than any that he had seen in this district. The trees were very straight, and it would be possible to get as many as 200 posts or more out of one tree. He was of the opinion that the timber would be suitable for railway sleepers, but did not think any industry would flourish until a railway was put from one end of the island to the other.

YORKE PENINSULA DISTRICT.
(TO BUTE.)

BUTE (Average annual rainfall, 15·42in.).
May 5th.—Present: 12 members and one visitor.

Care of Horses' Feet.—Mr. A. E. Bryant read the following paper on this subject:—"The feet of horses, asses, mules, and zebras have an outer wall or crust, a sole, bars, and a frog. The wall is highest in front and lowest behind, where it turns abruptly round and forms what are called bars, between which is situated the frog. The sole occupies the greater portion of the ground surface, and is carried backwards on either side of the frog. These horn structures have corresponding soft ones to which they are attached. The crust is held to the soft laminæ by fine ridges, which dovetail into the inner surface of the insensitive horn. There are hundreds of these, which may be seen by inspection of the hoof. The sensitive sole is attached to the insensitive one by a number of mushroom-like bodies called papillæ, or horn of papillæ. The attachment of the frog is just the same as the sole of the foot itself. The bars are the hardest part of the ground surface, being reflections of the crust, and of denser material than the contiguous structures known as the sole and the frog. The long pastern bone will be all visible; the short pastern, or coronal bone, will be found partly above the hoof and partly within it, while the pedal or coffin bone is wholly governed by the laminæ to which it is attached. Winged projections or extensions of the pedal bone exist on either side, and are called cartilages. These are important, being the seat of the side bone. A change in their structure from cartilage (which means gristle) to bone, constitutes side bone. On the under surface of the pedal bone is a very small shuttle-shaped bone. This is called the navicular bone. Its importance to the horse owner is its liability to a disease known as navicular lameness. This is supposed to be incurable, and will be chiefly found in horses running about the cities on paved streets or hard roads. The hoofs of all animals are attached above to a band which secretes the outer layer of hoof, and is called the coronet or coronary band. The growth and renewal take place from the laminæ and from the papillæ of the sole and frogs. Like the human nails, hoofs are always growing, to allow them to stand the wear to which they are necessarily subjected. The diseases to which a horse's foot is subjected are seedy toe, thrush, quittor, sand cracks, corns, and canker."

MAITLAND (Average annual rainfall, 20·08in.).
May 2nd.—Present: seven members.

Mr. Hill reported that for many years he had made a practice of putting down a pit of ensilage for autumn feeding to dairy cows. No trouble would then be experienced with the animals picking up bones, horsedung, &c. Dry bible would also be less prevalent. Mr. Jarrett said cows, if fed on ensilage in the late summer and autumn, would keep in better health, as the natural herbage then was dry and indigestible. Mr. Tossell advised the provision of an abundant supply of rock salt.

Exhibits.—Mr. Hill tabled a sample of ensilage made from Cape barley, cut with the binder and placed in the pit in sheaves. Members considered the sample rather coarse, and thought it should have been chaffed into the pit. Mr. Hill also tabled samples of hay chaff and grain separated from it. The hay was cut when the corn was in the dough stage and was then chaffed in the usual manner. The chaff was put through the motor winnower to recover the grain. Mr. Tossell had formerly tried this plan, but had given up the practice, as it involved too much labor. Both old and young stock had done well on straw and hay chaffed and mixed in equal proportions. The straw should be cut as soon after the stripper as possible. Farmers should have enough fodder on hand to last two years. Mr. Bentley said stock did well on molasses and chaffed straw. The straw was more palatable after it had remained in the stack for two or three years.

MOONTA (Average annual rainfall, 15·22in.).

April 25th.—Present: 10 members and two visitors.

Seeding.—Mr. P. Ford contributed a paper on this subject. He said—"If the fallow has been worked back since harvest, and is of a fine tilth, the shallower the cultivator is worked over it the better, so long as the rubbish is killed. If the fallow has not been worked back since the spring, it needs deeper cultivating, as it will be set rather firm. If it works up lumpy it should be harrowed before it is drilled. The drill should be kept close up to the cultivator in case of rain, or the soil will become set and will not bury the seed nearly so well. The shallower the seed is drilled in the better. It will germinate more quickly and with much less rain, and the roots go down through sweetened soil, which is not the case if it is drilled deep and on the hard bottom. The pressure springs should be released as much as possible. The weight of the hoe or disc is quite sufficient to bury the seed, providing the soil is not too wet. It pays to leave the drilling for a couple of days after heavy rain, as the soil is then too dead and sticky, the seed does not bury well, and wheat that is sown a week later will grow far better. The cultivator shares should be kept as sharp as possible, as this makes lighter draught for the horses, and cuts the weeds better. The drill should be well cleaned not less than once a week, and always be kept well oiled. For oats, 1½bush. of seed and 70lbs. of super. per acre should be sown, and for wheat, 1bush. of late varieties and 1¼bush. for early varieties with 1cwt. of super. per acre gives the best results. It is not wise to sow late wheats after the first week in June. If the soil is wet I prefer to pickle the grain, but if sowing under dry conditions I fail to see that any advantage is gained in pickling, as the grain that is not pickled will germinate more quickly and will come up thicker than wheat which has been pickled. I prefer the dipping process, that is, if the grain is in butts, so that the wheat is loose, and the solution can get through it easily and quickly. A 1¼ per cent. solution of bluestone is quite strong enough. The wheat should be in the pickle for two minutes. In a season like the present no wheat should be sown for at least a fortnight after the rain; after the rubbish has had a chance to grow." Mr. B. Fergusson agreed with the remarks of the writer of the paper. Mr. C. Nankivell had had good results from drilling in wet ground.

KADINA, May 2nd.—The subject of homestead meetings was considered at length, and it was eventually decided to accept an invitation to visit the farm of Mr. D. N. Martin.

WESTERN DISTRICT.

COLTON (Average annual rainfall, 17·01in.).

May 16th.—Present: nine members.

Rabbit Destruction.—Mr. Kenny read a paper dealing with this subject. The appointment of a travelling inspector last year, he said, had resulted in a great deal of good work being done in destroying rabbits in this district. In the event of a landholder not taking sufficient steps to check the pests on his land, the inspector should have the power to do the work at the landholder's expense. There was a large number of poison carts in the district which were not being used. Poisoning with phosphorus and, in the wheat paddocks, with bisulphide of carbon, would effectively check the rabbits, and he thought an inspector should be again appointed to see that the work was carried out. Mr. Barnes expressed his pleasure at the good feeling among farmers respecting the Board's efforts to bring the pest under control. He explained the portion of the Vermin Act relating to the summoning of defaulting landholders.

COORABIE (Average annual rainfall, 11in. to 12in.).

May 9th.—Present: 15 members and three visitors.

Shed-Building.—The following paper was read by Mr. V. S. Kingsley:—"In response to a request from the Chairman for a paper dealing with shed-building, I think that the most suitable shed to describe will be a barn or implement shed. The suggestions I make should only be regarded as applying to the particular type described; for as there are 'more ways than one of killing a pig,' so again are there many ways of putting up a shed. I do not recommend anyone to erect a building of any kind unless it is well and substantially constructed, so that it may withstand a good many years' storms and rough usage. Circumstances alter cases, as sometimes we have only a limited amount of material or capital at our disposal, and yet our requirements seem to demand a much larger shed than the capital warrants. Yet, with some amount of study and contrivance, it is possible to erect a shed nearly half as large again for the same money; but it would only be a flimsy affair, and would require stiffening and constant attention, until such time as the farmer could afford some more sawn timber. I wish to emphasise this fact, right at the beginning, that it is preferable to have implements under a roof in the off seasons than out in the sun and weather. Whereas, if in such hard times as we are at present experiencing, I say build a flimsy shed rather than have none at all, bear in mind all the time during its construction the necessity for adding more timber into its framework when your pocket permits, so that every piece of timber put in at the beginning must be so placed relatively to receive the extras as time goes on. It is suggested that we have an implement shed about 60ft. long by 30ft. wide. Such a shed will contain all the field implements of an average farm, and yet leave room to stack the season's super. and seed wheat. The latter can easily be protected with wire netting affixed to the upright posts of the building, to preserve it from the depredations of the fowls. But do not forget to give the cat a chance to inspect occasionally, according to her own free will. There is another very important item to be remembered with regard to the seed wheat, which may affect the actual position of your shed. That is the matter of 'pickling seed,' for you require to have your pickling plant fixed close by, and also your supply of water readily available for this purpose, so that you may perform this work under cover on wet days and so save time. For the uprights of the shed 3in. by 3in. jarrah is quite stiff enough. Of course, again, if your purse is small, you may use bush timber uprights, but I recommend stone uprights, say about 14in. square, instead of rough bush timber. I do not recommend plain concrete posts unless they are reinforced. The fascia, or roof plate, should be not less than 6in. by 2in., rafters 4in. by 2in., and purlins 3in. by 2in., binders and king posts 3in. by 2in., with joists of 5in. by 2in. This does away with the necessity for an inner row of uprights to support the ridge of the gable roof. The roof frames should be constructed on the ground and then elevated into their position, leaving a slot at the apex of each to slip in the 7in. by 1½in. ridge piece. With the roof frames it is of advantage to erect one of the ends first, and then, perhaps, the middle one, staying them into position temporarily with prop sticks and then with nails, and then put on the first portion of ridge piece and secure all together; after which the intermediate frames can be handled much more easily and slipped into their positions more readily. If, however, it is your wish to divide the shed into sections with partition walls for chaff and other storage, then perhaps it would be advisable to erect centre uprights at the beginning, and these posts would then carry the ridge; on the other hand I do not advise the centre posts being put in, for they always seem to be in the way afterwards. The roof should be covered with corrugated galvanized iron, 26 gauge, in 8ft. sheets, allowing a one and a half corrugation lap, the purlins beneath being placed about 3ft. 10in. apart for a flat pitch, or up to 7ft. or 8ft. for a steep pitch. The flat pitch of roof should have about 3ft. rise to the ridge from the gutter levels, whereas a steep pitch should be double this; ceiling space would then be given for hanger hooks to suspend carcasses of meat, &c., out of harm's way. The eaves, or ends of the shed, should be partly enclosed, that is to say, down to the levels of the gutters. The gutters should be not less than 4in. for a flat pitch or 5in. for the steeper. The height of the shed from the ground level to the gutters will depend upon the type of implement to be stored. For binders and harvesters not less than 8ft. is required; whereas for drills, ploughs, &c., it need not be so high. There is no particular advantage in building a shed too high, except for the reasons already mentioned. A good storage tank is necessary." Illustrations of construction, showing thrust and stress, were given on the blackboard.

KOPPIO (Average annual rainfall, 22·40in.).

May 7th.—Present: eight members and three visitors.

Bare Fallow or Catch Crops.—Mr. G. B. Gardner read the following paper:—"It has often occurred to me that bare fallow in a district with a good rainfall is not always the most profitable system of working a farm. The practice may hold good in districts where it is essential to conserve as much moisture as possible in order to give the crop a good start in the early autumn, or to conserve enough moisture in two seasons to grow one crop, or where one has rough land that bears but little feed and which is improved by breaking up, and, of course, scrub land that has but little feeding value. However, to take one crop only in two seasons off good paddocks seems to me a wasteful process, and I think we should get the equivalent of the grass we plough under from some catch crop, when we take into consideration that grazing the land can be made very profitable with wool and meat at anything like present prices. I am inclined to think it is well worth considering the wisdom of ploughing up well-grassed paddocks in the early spring, thereby losing the summer feed. Then there is the question of humus, which sooner or later will become depleted under a system of continual bare fallow. There seems to be a general opinion that bare fallow will always give very much better results than stubble ground. I do not dispute that such is the case in the majority of instances, but some of the difference is the result of the extra and more thorough working the fallow receives over the stubble land, which in the majority of instances is merely skimmed over once, and often ploughed and sown before the weeds have started, with the result that the weeds take as much out of the land as the crop, and the returns are unsatisfactory. I am, therefore, inclined to think that in this district, with its usually good rainfall, it would be more profitable to utilise the fallow to provide fodder crops for the summer and early autumn—a time when we are generally short of feed. On a well-appointed farm the paddocks should be small, and so arranged as to have permanent water in each. One of the many advantages of having paddocks of convenient sizes is that one may be planted some time before the other, and so one can avoid having the feed all coming on at the same time. I have found field peas a suitable crop on early fallow. These leave the land almost as clean as fallow that has been worked, as sheep will clean off everything, and the returns from the crop will be very satisfactory. By ploughing stubble land as early as the season will permit, that is, after the grass and weeds have started, and again cross-ploughing with the skim plough before drilling, we will obtain results that will more than pay for the extra labor. It is more profitable to have a limited area thoroughly cultivated and get good results than to scratch over a large one, half working the land, with the great chances of more or less failure. I have mentioned field peas as a payable catch crop because I have proved them to do well over a succession of years. I also tried kale last year with very good results, although grubs attacked it rather badly in the spring. It has made wonderful growth since the first rain, and is now giving a large amount of feed for the ewes and lambs. Some of the kale crop was ploughed under about six weeks ago, but it has shot up and is now quite a foot high, and making rapid growth. It seems to thrive well on sandy soil. Last year I also tried some lucerne sown with the hay crop, and although the season was very unfavorable it did fairly well. I sowed about ½lb. seed to the acre. I find that it does best on the stiff land. It has been ploughed since the early rain, and the lucerne is springing up through the furrows, seemingly none the worse for being loosened up. It would be profitable to sow a few pounds of lucerne seed to the acre with the manure, especially on land that is to be left out the following year. I do not suggest this as a substitute for a lucerne paddock, as I think it would be profitable to have several small paddocks thoroughly worked and manured and sown with about 10lbs. of lucerne to the acre. Anything we can do to improve the stock-carrying capacity of our holding is of as much importance as increasing our wheat yield, and we should be well advised to experiment in this direction." The paper created much discussion as to the respective merits of kale and peas as catch crops, both having been successfully grown in the district. It was contended that peas would give the greater quantity of feed off the same area, as kale would have to be ploughed in during autumn to make way for the cereal crop. Mr. Gardner said his experience was that kale did well on sandy land, rape on heavier soil, but peas did well anywhere, and, further, left the fallow clean. He considered that to fatten four sheep per acre on peas was a low estimate. He also favored sowing peas broadcast and ploughing or disking them in, as the drill did not seem to bury them well.

MITCHELL.

May 9th.—Present: 17 members and two visitors.

Horses.—Mr. R. Merchant read a paper. Horses should be fed four times per day, and given just as much as they would eat. On Sundays they should be given half the usual ration and run in the paddock. Rock salt should be in every manger, and salt should be mixed with the feed occasionally. Crushed oats and cocky chaff made good feed when hay was scarce. Separate stalls should be provided for mares with foals. The latter should be weaned at six months, being allowed to run in the paddock, the mares being confined. The team should be well groomed every day, special attention being given the shoulders. Well-fitting collars were necessary, and bags could well be used as false collars. The thick-set, nuggety animal was the best stamp for farm work. Generally, this was a good mover, and kept condition well. Horses should not be broken until 2½ to 3 years old. Water should always be provided before the animals were fed. They should not be worked after sundown. A spare horse should always be available, so that in case of accident to one it was not necessary to stop the team. Stalls and stables should be kept clean. On account of the danger of fire it was unwise to tie up the animals over night.

Sheep.—Mr. D. Ness also read a paper. He preferred the Merino sheep for this district, but if a cross for mutton were desired he advised the introduction of Romney Marsh rams. At three months well-fed lambs should weigh, dressed, from 35lbs. to 40lbs. For farm Merinos he recommended mating Canowie four-tooth ewes with Caroona four-tooth rams. When the lambs were four-tooth they should be mated back to Canowie rams. The rams should be put in with the ewes about November 20th, which meant that lambing would commence about May 1st. If shearing were commenced during the first week in October, these lambs should cut about 3lbs. of wool each. As soon as the sheep were full-mouthed they should be sold. Mr. Trimble thought it wiser to mate the ewes later than advised by Mr. Ness, there would then be more feed for the early lambs. In reply to a question, Mr. Ness said that when two-tooth ewes were mated the progeny generally were small and stunted.

PENONG (Average annual rainfall, 11·93in.).

May 9th.—Present · seven members.

Farm Implements.—Mr. J. Oats said the plough should be of medium weight and used for fallowing a good portion of the land proposed to put in. Often a good deal of draught was necessary if the ground were consolidated, and if the plough were too light it would strain. If it were necessary to again work the fallow a light skim plough or disc cultivator should be used, as this was much more economical than the heavy type for this purpose, and also for ploughing after the harvest if stubble land were to be put in. The wide drills were an advantage if the country were free from stumps and stones. But where stones or stumps were plentiful it was a mistake to have it wide, as the wide drills, when full of wheat and super., were very heavy, and with the bumping over the stumps and stones the wheels were liable to give way and the drills to sag in the centre. If over 13 hoe or disc it should have two drives for the wheat feed, or the bar was liable to twist. He preferred a drill of light draught, so that the horses could travel at a fair pace without being unduly tired. If the crop were a fair one, the binder should be used, as there was not so much waste as with the mower and rake, and a considerable amount of time was saved in the carting. During the past two years many farmers had found the mower and rake very useful, as the crops were too short and light to bind well. It was necessary to leave the sheaved hay in the paddock much longer than loose hay. In this district the stripper and motor winnower were preferable, on account of nearly, if not all, the farmers requiring a considerable amount of cocky chaff each year. During seasons like the past two the harvester could not be used to any great extent, and it would be found necessary to keep a stripper or two so that they could be used when the crops were light. If the country were loose or sandy a wagon with broad tyres (6in.) was preferable, because a full load could then be put on in the paddock, which effected a great saving in hauling. If the country were firm, the roads good, and the distance to market short, a wagon with tyres about 4in. wide might be better, as with the wide tyres the boxes were more liable to break. Mr. James Stiggants thought the stripper and motor winnower preferable to the harvester, especially on stumpy ground, as the harvester often caused a good deal of trouble. Mr. P. Farrelly would cut with the binder if the crops were good enough but found the grass cutter very useful during the past two years, as he did not take his binder out of the shed. Cocky chaff was useful, and he thought it would always be necessary to keep the strippers. Wide tyres for wagons were better in this district; he was using a 4in. tyred wagon and 50 bags was as much as he could put on at the heap. Mr. J. B. Oats found the binder a great save in labor. Sheaves were handy, and he had had no trouble to get the horses to eat the sheaved hay. He had had no experience with the harvester, but thought it unsuitable for hilly and stumpy country. He had used both the 3in. and 6in. wagon tyres a good deal and found the 6in. more suitable for the loose country. Mr. J. C. Stiggants said the harvester saved labor, but the stripper saved the chaff. If the paddocks were large and the crops good he favored the stripper and motor winnower. The wheels of wagons should be higher than they were usually made, as the higher wheels were lighter of draught. The Chairman (Mr. A. Shepard) was in favor of the narrow drill. With a wide drill full of wheat and super. and a 12-stone man on the footboard it meant a great strain on the implement going over stumps. The binder worked well if the crop were thick enough, but he would not bind a short, thin crop. With a grass cutter one could always secure some hay, if it were only a light crop. The harvester was not suitable where it was necessary to save the chaff, and it would not last so long as the ordinary stripper. If the bags were left unsewn the birds wasted a good deal of wheat. Great care was also needed with the motor winnower, as it was possible to waste a good deal of grain if it were not set right. As for wagons, it depended a good deal on the nature of the country. He had a 4in. and a 6in. wagon. If one got off the track the wide tyre was much better, but he also found they were much harder on boxes,

UTERA PLAINS (Average annual rainfall, 12·06in.).

April 11th.—Present: 15 members and four visitors.

Experimental Plots.—Messrs. Guidera, Gale, and Hornhardt undertook to conduct experiments on behalf of the Branch.

Bureau Work.—The Chairman (Mr. N. Guidera) read a paper, in which he said that every farmer could profit by membership in the Agricultural Bureau. Agriculture was a progressive science, and one of the means of keeping abreast of the times was by the education received through the medium of this institution. Experimental work should be undertaken by Bureau men, as the most reliable information could only be gained by practical tests on the individual farms.

Crows.—Mr. A. Venning read a short paper. He drew attention to the loss which crows had caused in eggs and chickens. Shooting did not seem a satisfactory method of destroying them. Poison had proved a failure. He had made a frame 12ft. by 14ft. and covered this with wire netting. One side of this was propped up with two props 6ft. long over the offal of a sheep. At the bottom of each prop a wire 15ft. long was attached; the two wires being joined to a single wire at the end. The latter was sufficiently long to enable one to pull away the props and allow the framework to fall on any crows that were attracted by the offal. Last year he had destroyed 90 crows and one eagle in this way.

Seed Wheat Selection.—The Chairman also drew attention to a paper in the *Journal of the British Board of Agriculture* in which this question was put—"Does continuous selection improve the seed and the crops, or does the want of selection end in deterioration? The authors of this paper—C. and A. Hagedoorn—state that about 1843 to 1850 Vilmorin selected typical heads of wheat of each variety then cultivated. From each he took a single grain, and propagated a crop in successive years. The original heads were labelled with their name and date and put away. In the year 1911, about 60 years after, this collection of heads was discovered in a drawer. Heads of 12 varieties of wheat were put alongside the original ones, the new heads being the lineal descendants of the old. Absolutely no difference was apparent between the old and the new. One reason adduced for this is, that corn crops, such as wheat, oats, and barley, are self-fertilising, and consequently each keeps its own strain, as it were, perfectly pure; and therefore apparently we can grow indefinitely any particular variety of corn without deterioration, so long as it is pure and is kept free from admixtures, and selection does not appear to improve it. It is in the case of plants where cross fertilising takes place that there is room for improvement and development, such. for instance, as with peas and potatoes, and even rye. With such crops there may be either improvement or deterioration, and therefore artificial selection must be practised. It would be instructive to have the comments of some of our seed growers on the above discovery, as one of the great points in connection with corn growing has been not merely to select seed from the best part of a crop, but actually to select the best heads, and from those the best single grains, with the intention of further developing, or at least keeping each strain pure. From the above it appears that this is quite unnecessary, but it is desirable to have the matter thoroughly thrashed out."

UTERA PLAINS (Average annual rainfall, 12·06in.).

May 9th.—Present: 16 members and seven visitors.

Oats.—The Hon. Secretary (Mr. J. Abrook) read a short paper. After experience of New Zealand Potato, Scotch Grey, Algerian. Cape, and Tartarian oats, he had come to the conclusion that the Algerian variety was the best suited to this part of the State. The chief advantage with these was that the crop did not go down. Oats gave a better crop than wheat in a dry year, it discouraged takeall and added more to the humus content of the ground. Members generally agreed with the opinion of the writer of the paper.

YADNARIE (Average annual rainfall, 14·09in.).

May 9th.—Present: 17 members and three visitors.

Horses.—Mr. A. J. Hutchinson read a paper dealing with the care of horses. A colt to be handled should be run into a loose box and tied up, he said, but on no account should it be choked down. It should then be rubbed well about the head, and encouraged to lead. If it became necessary to use a whip the animal should be lightly touched just behind the forelegs. When the colt was sufficiently tractable to be put in harness, it should go in the near side of the body of the wagon. Here it should be handled as quietly as possible. If it worked too hard for the first two or three days and then became stale, it should not be forced, but given a few days spell, after which it would feel more at home in the harness, and probably work better. During the first week, at least, after the animal had been unyoked, its shoulders should be washed with cold water. The collar should fit well. The horse should be given a name, which should be made use of when it was made to stand over, &c. Kindness and firmness were essential. When teaching a horse to jump it should be first of all schooled over a sheep hurdle with plenty of lean, the pace, and the height of the hurdle being gradually increased. A lengthy discussion followed. Mr. W. Brown, Mr. H. S. Bauer, and Mr. R. B. Deer all thought it unwise to handle young foals before they were being broken in.

YALLUNDA (Average annual rainfall, 18in. to 19in.).

May 9th.—Present: six members.

POTATOES.—Mr. P. Provis read a paper on the subject of planting potatoes. He said —" One of the best ways to keep potato seed is on a piece of good, firm, dry ground, in the shelter of some evergreen tree. Spread the tubers thinly and turn them often ; the more they are exposed to the light and, if possible, the sun, the hardier they become. A tuber that has become green will resist an ordinary frost, and may remain exposed the whole winter on the surface of the ground without rotting. The rules to observe in cutting seed are—First, look for the well-formed eyes, which throw out the strongest shoots, and then cut the tuber in order to have at least one to each set. In a dry season, or in districts with light rainfall, large sets are the best, as the plant in the early stages of growth depends largely on the parent tuber for moisture. It is better to have more than one eye, as all do not throw out shoots. A large set with many eyes is just as liable to rot as a smaller one with only one eye ; it is the condition of the tubers and the state of the land that cause seed to rot. Sets with a single eye should only be planted in well-prepared land suitable for potato-growing. On the question of cutting nearly everyone has his own ideas. From 4in. to 5in. has been found the most suitable depth to plant. If planted too near the surface early varieties or crops in early districts suffer from the potato grub. In ordinary soils 27in. to 30in. has been found a suitable width between the rows, with from 18in. to 24in. between the sets. Seed should be planted the day that it is cut. It is not necessary to use any material to dry the cut sets, as a cut tuber does not bleed. The potato is composed of starch, and naturally dries quickly; if it does not it will rot in the ground. If the seed is wet it is liable to rot. After rain, do not start planting with cut seed until the ground is dry." Mr. G. Teakle strongly favored Redskins for this district.

GOODE, March.—Mr. L. Will thought the most profitable method of cultivation to adopt in this district was to clear as much scrub as possible at first, take off three successive crops, and then let the paddocks remain under grass alternately. By keeping sheep a good deal of expensive working could be obviated. Mr. N. Packer advised the use of the horse rake to gather roots and rubbish, which could be burnt on the stumps. The harrows could then be used more frequently.

WHEAT STANDARD.—At a previous meeting members expressed the view that it was not advisable to fix the wheat standard too high. A resolution was carried that—" More satisfaction would be felt if the standard were fixed earlier in the season, and the Government should assist in fixing the standard."

ROBERTS AND VERRAN.—It was decided to conduct tests with different quantities and different grades of manure.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BERRI.

March 7th.—Present: 22 members and five visitors.

CITRUS CULTURE.—The following paper was read by Mr. F. Arndt:—

Introduction.—Before I came to Berri, some three years ago, my experience of citrus had been chiefly confined to the Adelaide plains, and therefore the observations made on my own and on other citrus plantations growing under the conditions pertaining to the Murray Valley have not been of very long standing. To obtain further information regarding the culture of citrus under local conditions I have written to some of the largest growers along the Murray, and am much indebted to the following gentlemen for valuable information and advice :—Messrs. F. J. Olorenshaw, W. E. Muspratt, C. H. Peperkorn, and H. S. Taylor, of Renmark, and Messrs. F. W. Pickering and T. S. Dove, of Mildura ; also to Mr. Geo. Quinn, the Government Horticulturist.

The Question of Site.—The elements that citrus growers have most to contend against in the Murray Valley are high winds and frosts, and the grove should, if possible, be so located as to escape their ravages. The greatest enemy to be feared is, no doubt, frost, for although the evil effects of heavy winds can to a considerable extent be modified by planting belts of shelter trees, frosts cannot be evaded by such simple means. It is a matter of common observation that frosts are the most severe in valleys, hollows, and low areas, while the adjacent hillsides or elevated lands remain comparatively untouched. A citrus grove should therefore never be located in a hollow, basin-shaped depression, or in a narrow gully. The ideal position is on a slope facing the east, as experience has shown that the rays of the rising sun are less injurious to frosted plants than they are if the sun is some distance above the horizon before it strikes them; while the slope of the ground will allow the cold air to drain off into lower levels. Of course, a situation facing the east, although desirable, is not essential for the location of the grove, the one thing necessary being that the plantation has perfect air drainage so that the cold air can drain away, and therefore a position on sloping ground is the best. The planter should not plant any evergreen shelter trees along the boundary at the lowest portion of the grove. Such trees, being in full leaf when the frosts occur, prevent the cold air from passing freely away and force it back upon the plantation, thus causing frost on the lower portion of the grove. Should a breakwind be required along the lower boundary it should consist of deciduous trees.

Suitable Soil.—Experience has shown that loose rich soils which have perfect drainage have given the best results. This does not mean that citrus will not grow on rather heavy land. On the Adelaide plains I have known oranges to do remarkably well on heavy clay soil, full-grown trees averaging about four cases of fruit to the tree per year. Young trees, however, are difficult to start in such soil, and their growth for the first three or four years is very slow. Citrus of all kinds do remarkably well in deep sandy loam, and such land is to be found by the thousands of acres on the pine and mallee rises along the Murray Valley. The chief essential of citrus land is that it must have perfect drainage, and therefore shallow soils, or very heavy soils whereon the water stagnates must be avoided by the planter. The drainage of a piece of land depends chiefly upon the nature of the subsoil, and land that has a very heavy subsoil should be avoided. The prospective citrus grower who selects a deep, rich, loamy piece of ground, having a fair even slope to allow for the underdrainage of moisture and for the drainage of the cold air from above, will have made about as good a selection for the site of his grove as can be obtained under river conditions.

Preparing to Plant.—To have the land grubbed will cost from £2 to £7 per acre at Berri, according to the amount of timber and undergrowth on the land. The land must then be ploughed, and all irregularities graded off so that it has an even surface. The next thing to do is to have the irrigation channels, from which the land is to be watered, put in. This work is usually done by the Irrigation Department, the settler directing where the channels shall go. Great care should be exercised by the settler in this matter. More mistakes have been made by settlers at Berri and at other irrigation places along the Murray in the laying down of their channels than in anything else. As the loose soils, of which the irrigation colonies largely consist, make the furrow system of irrigation the only one possible, it stands to reason that the first trees of a row will always obtain more water than the last ones, as the water will have flowed a considerable time past the first tree before it reaches the last one. Therefore the longer the rows the more water will the first trees receive and the less will the last ones. For this reason the channels should be so laid down that the rows of trees they have to water are short. Five chains is quite long enough to water in one section. Under no circumstances should rows be watered over seven chains long. In fact, in dealing with citrus, it would be wiser to make two sections out of a seven-chain row. Of course, short rows mean much channelling, which greatly adds to the first cost of the plantation. But in the long run it will be found to pay, as in watering long rows the top land ultimately becomes waterlogged, and, unless the underdrainage is unusually good, the surplus water will appear lower down the rows as seepage, bringing alkalies to the surface and killing the trees in its vicinity. Another thing the settler must see to, and that is that the channels are so situated that the grade he will have to water along is neither too steep nor too level. A too steep grade will cause the top land to wash away, while with a very level grade the water will take too long to reach the bottom of the rows. Local experience has shown that it is a mistake to water straight down steep sandy rises, as the water invariably washes out deep gutters at the top of the block, silting up the furrows about one-third down the rows, which causes the water to spread over the land at this portion of the holding while very little water at all gets to the end of the rows. On the loose sandy loam of the Berri slopes a fall of one foot to the chain will be found quite enough, while anything under 4in. to the chain is too little.

Pegging Out.—After the land has been cleared, ploughed, graded, and channelled, it should be pegged out ready for planting. This is usually done with the aid of a wire line, in which tags have been inserted at the distance apart that it is intended to plant the trees. The line is stretched tight at the required angle the rows are to run, and a peg driven in at each tag. First of all the breakwind along the boundary should be pegged. If the breakwind is to consist of almonds or pears (which are usually planted here) 12ft. is far enough apart. The land for the citrus trees should then be pegged out. Headlands of 20ft. to 24ft. should be left all around the piece pegged, and where the citrus rows approach the windbreak about 26ft. should be left. Citrus are usually planted 20ft. to 24ft. apart on the square. Most of the older citrus groves at Berri have been planted with the trees 20ft. apart, but where the soil is very rich 24ft. apart will probably not prove too great a distance in years to come. As citrus take many years to come into bearing interplanting with other varieties of quick-bearing trees, such as apricots or peaches, is often resorted to, with the object of getting some early return from the land, and to root the interplanted trees out when the citrus come into bearing. This method is not to be recommended, as the almost invariable result is that the quicker growing trees rob the citrus of plant food and moisture, and that just when the interplanted trees are beginning to bear profitable crops in their fourth and fifth years, they must be rooted out to give the citrus a chance to develop.

Cover Crops.—Owing to the heavy spring winds that sweep along the Murray Valley, the planting of cover crops in among young trees to protect them from wind-blown sand becomes a necessity. The cover crop should be sown before the trees are planted, so that the young trees have shelter from the start. So far, wheat has proved itself to be the best cover crop at Berri, which, besides affording excellent shelter for the young trees, is profitable to the settler in the form of hay. The wheat should be drilled in between the rows after the block has been pegged out. A strip 12ft. wide is quite enough for the first year, while a 6ft. strip is enough to protect the trees in their second and subsequent years. It is not advisable to broadcast the wheat and plant the trees in among the crop later, unless an 8ft. strip is ploughed in where the rows of trees are to be; for if the cover crop is too close to the trees it will rob them of moisture, and become a curse instead of a blessing. To get the best results the cover crop should be drilled in early, say in May or early June, and the land should be ready for the drill by then; but if not, it should be put in, no matter how late the season, as even a moderate growth will keep the land together. Citrus growers along the Murray learned a severe lesson during the spring of 1912, when, through the neglect of planting cover crops, the fierce September and October gales killed the young trees by the hundreds with sand drift.

Ordering Trees.—Long before the land is ready for planting, the prospective grower, if he is wise, will have given in his order to a reliable nurseryman, and thus be certain of getting his trees. The chief thing to remember in ordering is to get *good* trees. To stand the check from shifting from the nursery to the orchard a young orange tree should be sturdy, healthy, and have its wood well matured. A tree two years old from the bud will give the best results, and, providing it receives reasonable care in removal from the nursery and in planting in the orchard, should grow right away. Forced trees, with young, sappy growth, should be avoided by the grower. However cheap, they will prove dear at any price. Good, strong, well-matured trees will very probably run £2 per 100 more than forced immature ones, but the grower will gain this in his first year in the smaller percentage of misses he will have. Now as to the varieties to order. The Washington Navel is still first favorite wherever it can be successfully grown, and is no doubt likely to remain so for many years to come. For size and quality it cannot be beaten, and in California it has practically driven all other varieties out of the market. Another variety now becoming popular in California is Thompson's Improved Navel, said to be an improvement on the Washington Navel, in so far that it ripens considerably earlier than the Washington, and that its fruit is of a somewhat smaller size. The Valencia Late also comes with a big reputation from America, but so far has proved itself a shy bearer in South Australia. In mandarins, Dancy's, usually called Tangerine, is perhaps the best variety to grow. It has a handsome appearance, excellent flavor, and is said to ship better than other varieties.

Stock.—Another thing the planter will have to consider is upon what stock the young trees are budded. In Australia citrus trees are usually budded upon Seville, sweet orange, and lemon stock. Of the three the Seville stock makes the hardiest tree, and American and Australian experience seems to be at one in this matter. The Seville is not so liable to collar rot as the lemon and sweet orange, and can therefore be grown on wetter land than either of the other two. In Florida, which has a 50in. rainfall average, the Seville stock has proved itself able to withstand floodings and to grow in fairly moist situations. The Seville as a stock causes slow growth to the variety budded upon it, makes for a rather dwarf, bushy tree, and the fruit, although of good quality, is smaller than that grown either upon sweet orange or lemon stock. The sweet orange as a stock makes for a quick-growing, vigorous tree, and is now generally preferred in South Australia to all other varieties. Messrs. Muspratt, Peperkorn, and Olorenshaw, of Renmark, however, hold with the Seville stock, as it is less liable to collar rot. On a good loose, loamy soil, where water does not stagnate around the butts of the trees, and where the drainage is good, the sweet orange stock gives good results. It gives a large and vigorous tree, and induces a good crop of good-sized fruit. For well-drained land this stock is recommended by Mr. F. W. Pickering and Mr. T. S. Dove, both of Mildura, gentlemen well famed for their knowledge of citrus fruits, and by Mr. Geo. Quinn, the Government Fruit Expert. As a stock, the lemon is the least hardy of the three varieties under consideration, as it is more liable to collar rot and is impatient of much moisture around the roots. Trees on this stock should not be planted on soil likely to be flooded by rain or irrigation water, but will succeed on dry situations having good drainage. Lemon stock is the favorite stock at present used in Sydney, having practically superseded the Seville and sweet orange for that purpose. The lemon stock gives rise to a tall, vigorous tree with large-sized fruit, and trees budded upon it grow more quickly than those budded upon any other variety of citrus. In my young plantation Washington Navel trees budded upon sweet orange and lemon stock were planted side by side, at the same time and in the same class of soil; and at the present time not only have the trees on the lemon stock beaten the others in growth, but in fruitfulness as well. However, owing to the fact that the lemon is more liable to gum disease, and cannot withstand much water-logging of the soil, care should be exercised in planting this stock only on soils having perfect drainage. Mr. T. S. Dove, of Mildura, in reply to my inquiries regarding citrus stock, has summed up the matter in a nutshell: "Lemon stock on dry situations with good drainage; sweet orange on dry situations with good drainage and medium to light soil; and sour stock on wet land likely to be flooded."

Planting Out.—The land having been prepared and pegged out, and trees of the required kinds ordered from the nurseryman, the next operation for the settler will be planting the grove. At Berri, and along the river generally, citrus are usually planted in September with the first irrigation. Autumn planted trees, watered with the last irrigation, have also been known to do well, but the risk is great if the winter should be cold and dry (as is often the case), and no irrigation water is delivered the settlers during the winter months. When the young trees arrive from the nursery they should be heeled in a shady place and watered. Before planting out into the orchard, the roots of the trees should be lightly pruned, cutting off all injured or straggly roots. The tops should also be cut back, according to the size and vigor of the tree. However, it is not advisable to head a tree higher than 2ft., while under 18in. is rather low. The trees are best planted while the irrigation water is running along the furrows, or just before the irrigation is taking place. A square hole is dug alongside of each peg large enough to hold all the roots of the tree without cramping. The trees should not be planted deeper than they stood in the nursery bed. A planting board, made out of an ordinary piece of board with a notch cut in at the centre, will be found very handy in setting the trees. Place the board over the centre of the hole along the line of pegs, place the tree in the notch at the mark showing the depth it stood in the nursery, and fill it carefully with earth. By this means the trees will be planted the right depth. Citrus never do well if planted too deeply, and if planted below the bud are liable to develop collar rot tendencies if water stagnates around the union of the scion and stock. After the tree has been planted it should immediately be given a bucket of water, and receive a good irrigation within a few days.

Irrigation and Cultivation.—After planting the grove the most important factor governing the success of the settler's enterprise is good cultivation. This cannot be too strongly insisted upon. Living in a climate wherein the temperature often remains at 100 degrees or over for weeks at a time it is absolutely necessary for the grower to conserve all the moisture the land receives, either in the form of rain or irrigation water. Within the Berri Irrigation Area the settler receives 24in. of irrigation water per annum, which is generally supplied in six irrigations. This averages 4in. per acre per irrigation, which is ample, provided the grower cultivates his land well. In fact, after the trees are once established, I consider from 16in. to 18in. of irrigation water per annum is sufficient for young citrus trees before they come into bearing. The careless cultivation that some citrus groves have received at Berri has resulted in great losses of young trees during the last few years. Flooding the land with copious supplies of water and cultivating but little is a most foolish policy for the grower to adopt. By such means the top layer of soil, wherein the roots of the young trees exist, soon dries out, and the trees suffer from drought, while the water that has sunk down more deeply is liable to soak along the subsoil and come out in the lower portion of the grove as seepage.

Dealing with Cover Crops.—If the grove has been laid out in the manner previously suggested, with a strip of cover crop down the middle of each row, it will only be possible to cultivate a strip of land about 3ft. wide with a single horse cultivator along each side of the rows for the first two irrigations. All weeds in between the trees along the rows should be hoed out, and the whole 8-ft. strip along which the trees have been planted should be kept perfectly loose and clean of weeds. As the evaporation during the early spring months is not severe, this cultivated strip of land will be found sufficient for the satisfactory growth of the trees. After the cover crop has been removed, about early November, the cultivated strip should be enlarged, by a two-horse cultivator or disc harrow driven once along each side of the rows. After December, when the winds have subsided, the whole plantation should be disked up. By disking, the stubble of the cover crop remains on the surface, thus preventing sand drift should there be heavy January winds, which sometimes occur. For the rest of the season there should be thorough cultivation of the whole grove after every irrigation or after every rain of any consequence. In the autumn the land should be ploughed, harrowed, and a 6-ft. strip of cover crop drilled in between each row of trees. As the trees become older they will shelter themselves more, and the necessity for a cover crop will not be so great. More cultivation must then be resorted to, as the trees will be taking more moisture out of the soil, and the cultivator will have to be kept busy throughout the entire season.

Pruning.—As a whole no class of fruit trees require less pruning than citrus trees· At the time of planting the young trees should be cut down to about 18in. to 2ft. When growth commences young shoots will spring out all along the stem. All shoots below a foot from the ground should be rubbed off, thus allowing a clean stem of at least 1ft. where the trees have been cut back to 18in. Where the trees have been left 2ft. high a clean stem of 18in. should be left. Some years ago it was the custom to grow high-headed trees having a bare trunk of 4ft. or over. Experience having proved that high-headed trees are more liable to suffer from strong winds, more liable to have their stems injured from sunburn, and that the fruit is not so cheaply gathered as from the low-headed trees; some citrus growers went to the other extreme, and headed their trees but a few inches above the bud. This made for a low bushy tree with branches very close to the ground, which brought a portion of the fruit into contact with the earth. Present Californian experience favors a tree with a clean stem from 1ft. to 18in. in height, which is practically the same that Australian citrus growers have adopted. Citrus trees usually make from two to four growths during the season. The young growth is often so rapid that it cannot support itself, and bends down until it touches the ground. It is not advisable to have the branches as low as this, as on frosty nights the cold is greatest nearest the ground, and the fruit is liable to be frostbitten. Therefore, whenever the branches bend down too low they should be cut back to an upward bud at the place where the downward arc commences. The main branches of a citrus tree should have an upward tendency. The natural drooping habit of a tree so trained will soon assert itself again through the formation of side branches, and through the weight of the fruit. Citrus trees that have become too dense in the head should be thinned out somewhat, to let in a little light and air, as darkness is conducive to the growth of insect pests. All dead wood should also be removed. The best time to prune citrus trees is during their growing season, that is, during spring and summer, and it is best not to leave the operation until too late in the season, as it is liable to force out late growth which may be injured by early frosts.

Manuring.—Of all the operations connected with the growing of citrus fruits the subject of manuring is one of the most important. However rich the soils may naturally be, through continually cropping they will sooner or later become impoverished unless sufficient fertiliser is applied to the ground to replace the plant food removed. The elements which enter into the composition of plants are carbon, oxygen, nitrogen, hydrogen, potassium, calcium, magnesium, phosphorus, sulphur, and iron. Of these, all except nitrogen, potash, phosphorus, and sometimes lime, are usually present in sufficient quantities for the needs of the trees. Of the three essential elements, nitrogen, potash, and phosphoric acid, nitrogen causes strong, vigorous growth, potash plays an important part in the formation of plant starches and sugars, while phosphoric acid is necessary to the formation of a class of nitrogenous compounds. known as proteids. Young citrus trees require a liberal supply of nitrogen if they are to make vigorous wood growth. When the trees come into bearing very large amounts of nitrogen are no longer necessary, as they impair the fruitfulness of the trees, wood formation taking place at the expense of fruit. Citrus trees of all ages should always be supplied with a liberal supply of phosphoric acid (phosphates) or the health of the trees will suffer, and the fruit will not develop normally. For the formation of citrus fruits a plentiful supply of potash is essential, as it plays an important part in the production of plant-starches and sugars, of which the fruit greatly consists. Harold Hume, of the University of Florida, the great American citrus expert, says of potash manuring in respect of citrus trees—"If large amounts of potash are taken up by the trees it will be found that the rind of the fruit will be much thinner than otherwise and the amount of rag will be greatly lessened. A plentiful supply of potash in the fruit has an excellent influence on its keeping quality. If too little be present the fruit will be soft and is likely to break down shortly after removal from the trees. To increase the keeping and carrying quality of citrus fruits a large amount of potash and a small amount of nitrogen should be used." The Agricultural Experimental Station of the University of California has computed that 800lbs. of oranges remove from the soil about 1⅞lbs. nitrogen, 2lbs. potash, and ½lb. phosphoric acid. According to these figures a crop of 200 cases of fruit, weighing roughly about 4 tons, would remove from the land about 24lbs. of potash, 6lbs. phosphoric acid, and 14lbs. of nitrogen. In addition to this provision must be made for an unknown quantity of plant food which leaches out of the soil, and for the food supply necessary for the tree to form new branches, roots, and leaves. Hume considers that the total plant food removed from the soil is about three times the amount removed by the fruit. Therefore, supposing that the 200 cases of oranges were produced from one acre of land, the total depletion of plant food would amount to 72lbs. potash, 18lbs. phosphoric acid, and 42lbs. nitrogen to the acre. As the chemical fertilisers in use only contain from 16 per cent. to 50 per cent. of the necessary ingredients of plant food, the grower will have to use about 1½cwt. of muriate or sulphate of potash, 1cwt. of phosphate, and 2cwts. of sulphate of ammonia to make good this loss from the soils. The demands of young and old trees being different, the fertiliser supplied to the soil should be different in character. Young trees require a large amount of nitrogen, while bearing trees require relatively less nitrogen and more phosphoric acid and potash. Hume considers that for young trees the fertiliser should contain about 4 per cent. nitrogen, 6 per cent. phosphoric acid, and 8 per cent. potash, while one containing 3½ per cent. nitrogen, 8 per cent. phosphoric acid, and 12 per cent. potash should be applied to bearing trees.

Renmark and Mildura Practice.—To obtain information regarding the manuring of citrus groves along the Murray I have asked some of the leading citrus growers for their ideas on this subject, and the following are some of the replies:—Mr. W. E. Muspratt, of Renmark, says that on good virgin land orange trees should not require manuring for the first five years; at six years 2cwts. bone super., 1cwt. potash, and the ploughing in of a green crop of peas to supply nitrogen; but when the trees are full grown half a ton of fertiliser to the acre would not be too heavy a dressing. Mr. T. S. Dove, of Mildura, uses half a ton of blood manure, 6cwts. of bonedust, and 1cwt. of potash to the acre. Mr. Dove is of the opinion that organic manures are best for citrus trees, and believes in the regular ploughing in of green crops of peas, tares, and vetches. Mr. F. W. Pickering, of Mildura, recommends for trees in full bearing 3cwts. blood manure and 3cwts. bonedust to the acre every alternate year, and a cover crop of field peas and beans mixed every other year. The cover crop should be given a dressing of 2cwts. of superphosphate to the acre at time of planting, and when mature should be disked in and not ploughed in. The citrus groves planted on the fertile Berri slopes will probably not want much manuring for some years to come, but when fruiting commences a good supply of potash will have to be given to the trees. In land so well supplied with nitrogen as most of the Berri land is, where the native vegetation was dense, the disking in of cover crops of peas or vetches to add nitrogen to the soil is hardly necessary for a start, but will, no doubt, have to be resorted to in years to come, when this class of plant food becomes depleted. For citrus trees planted on stiff clay soil, the disking in of cover crops to add nitrogen and humus to the soil should be commenced early, so as to get the soil into a loose, friable condition.

Pests and Diseases.—The South Australian portion of the Upper Murray Valley is in so far favorably situated for the growing of all kinds of fruit as it is practically free from insect pests. The greatest of all citrus pests, the red scale, seems to be unknown here, and it is to be hoped that it will remain so. The *red scale* is a small circular insect of a somewhat reddish-brown color, which increases very rapidly under favorable conditions. The only effective way of getting rid of it, should it make its appearance in a citrus grove, is by fumigating with hydrocyanic-acid gas, which is generated by treating potassium cyanide with diluted sulphuric acid, the gas being liberated under a tent which covers the tree. The genus of *Lecanium*, or unarmoured scales, are more widely distributed. Of these, the *brown scale* is the most common. The full grown insect is about one-eighth of an inch long, broadly oval, convex upon the disc, surrounded by a thin flat margin, and of a brownish color. This scale lives upon the bark and leaves of the branches of the trees, especially those not exposed to the sun and air. The brown scale is fairly common along the Murray Valley, and although not of so dangerous a nature as the red scale is, nevertheless, best got rid of. The treatment consists of fumigating for very bad cases, and of spraying. Spraying with red oil or kerosine emulsion is effective. Kerosine emulsion is the better of the two, as it does not burn the leaves so much as red oil does. I have found the following formula for kerosine emulsion very effective:—Two gallons of kerosine, ½lb. soap, 1gall. water. Dissolve the soap by boiling in the gallon of water. Take off the fire and add the kerosine slowly, churning the mixture with a spray pump for 10 minutes or so until a stable emulsion is formed; then add another gallon of warm water to bring up the solution to 4galls. The best time to spray is in the summer months in between the growths, when the trees are dormant. For spraying at such times, dilute each gallon of the emulsion with 10 of water. I have not found this preparation too strong for the trees. Should the trees be in active growth, however, 15galls. of water to one of emulsion will be strong enough. Spray at intervals of a fortnight for two or three times, which ought to be sufficient to eradicate this scale. One of the worst diseases of citrus trees in America is mal-di-goma, or foot rot. It is also prevalent in Australia, although not to so great an extent. Foot rot attacks citrus trees at the crown roots, extending a foot or so above the ground and downward among the roots. The presence of the disease is first noticed by the discharge of gum at the diseased spot. Later on the bark rots away, and the tree eventually dies. The disease seems to be caused either by water standing around the roots, the crown roots becoming injured through careless cultivation or otherwise, or too deep planting. As these matters rest greatly in the hands of the grower, the careful orchardist will see that his trees do not needlessly suffer from these causes. Where the land has to be flooded to water the trees, the trees should be budded on the Seville stock, as American experience has amply proved that both sweet orange and lemon stock are liable to suffer from foot rot if planted in wet situations.

Yields and Prices.—Compared with most varieties of fruit trees citrus trees come rather late into bearing. Although a few fruits may form in their third year, citrus trees do not usually bear a paying crop until they are seven years old, while they are usually not in full bearing until their tenth or twelfth year. The average Californian crop per orange tree is about one and a half cases of about 80lbs. each, or about 120lbs. per tree per annum, according to statistics lately published in the *Pacific Rural Press*. Of what I can see from the information I have gathered from riverside settlers, the average crop of a full-grown tree along the Murray Valley is about four cases. At present prices this is a very paying proposition. To secure the best prices for his fruit the grower must be very careful in the harvesting and handling of his crop. As an orange is easily bruised and injured by the finger nails of the picker entering the rind, gloves should be worn by the picker, and the fruit picked into a padded picking bag. From there it should be carefully placed into cases, the fruit being placed in, not tipped or rolled in. After the fruit has been brought into the storeroom it is usually placed on shallow shelves, and allowed to remain there for a few weeks until a great portion of the moisture has dried out of the rind. This process, which is called "curing," causes the rind to become tough and leathery, thereby rendering the fruit safer for shipment.

The Over-Production Bogey.—With hundreds of acres of oranges now being planted along the Murray as well as at other places, the question naturally arises what the future of the citrus industry is going to be. In more than one quarter the idea has been expressed that the orange is being overplanted, and that citrus growers will soon be faced with an over-production of their fruit. One thing appears certain, and that is when all the recently-planted groves of Washington Navels come into bearing, the price of this fruit will fall, and growers will have to be satisfied with much lower prices than are at present obtaining. Washington Navels at 10s. per case wholesale are rather a dear article for the average Australian working man to buy by the time he purchases them from the retailer. It is no doubt a fact that for the average Australian the navel orange is still a luxury. Were the prices of navels reduced by one-half, I have no doubt that the Australian consumption of this fruit would be enormously increased. I believe 5s. per case at the orchard for Washington Navels would still be a paying proposition for the grower. Even at the small average of two cases to the tree, and allowing 100 trees to the acre, the gross return to the grower would still be £50 to the acre. Allowing £12 for cultivating, £6 for manures, £2 for water rates, £3 for picking, and £2 for other expenses to the acre, the grower would still clear £25 net per acre.

Export Prospects.—Even at such cheaper rates, should the production exceed the Australian consumption, exporting will have to be resorted to. Australian oranges arrive in Europe during July, August, and September, when the market is bare of citrus fruits. There should not be any great difficulty in opening up a big trade with England, Germany, France, and perhaps even with the United States of America, if we can land a good clean article in these countries, So far Australian oranges have not shipped too well to Europe, a great proportion of the fruit going bad on the way; but with careful picking, careful packing, pre-cooling at the shipping port, and the keeping in cool storage on the voyage at an even temperature, there seems no reason why oranges should not be as successfully shipped to Europe as other fruit. The few Australian oranges that have been sold in England have realised about £1 per case. At this price there is but a limited demand. Major Norton, the South Australian Trade Commissioner, says that at 12s. per case, about 30,000 cases of Australian oranges could be sold in England per annum. Even at this price the majority of Englishmen could not afford to buy Australian fruit. Through the expenses of transport, Australian oranges could not be sold any cheaper in England than 10s. per case, if they are to yield the grower a payable return. As the English demand for such priced fruit is limited, the markets of such prosperous and populous countries as Germany and France would no doubt pay for exploitation. The idea has often been expressed that the Washington Navel as grown here is too large, and that for export purposes an orange should be sent home that would retail for a penny apiece. There does not seem much prospect of ever selling the Navel at a penny apiece at a profit. Even allowing as many as 120 oranges to the case, and the case at 10s., this would still work out at a penny each wholesale. The only orange that would perhaps pay to retail at a penny apiece in England in the Mandarin; and the variety Dancy's, said to transport well in America, may possibly fill the bill. Should the local over-production of oranges become so great as pessimists predict, the citrus growers of Australia will have to form themselves into a co-operative body, as has been done by the citrus growers of California, and, like the Australian Dried Fruits Association, keep up profitable local prices and export the surplus.

Conclusion.—In conclusion, I would like to remark that there is, perhaps, no horticultural industry in which the personal factor counts for so much as in citrus-growing. Right from the time the young trees arrive at the orchard until years later, when their fruit is packed ready for shipment, the citrus grove will require the constant care and attention of the grower. No class of fruit trees respond more readily to good treatment than citrus, and no trees do worse if neglected. The grower who gives his grove intelligent attention will receive his reward in profitable crops, while the man who neglects his trees will have to carry on his grove at a loss. But if the grower has located his grove on a situation having perfect air and water drainage, plants good trees, irrigates intelligently, cultivates well, manures liberally, sprays or fumigates for insect pests if necessary, and harvests his crop with care, there is no reason why he should not make a financial success of his undertaking, as hundreds have done in the past, and as hundreds are still doing.

Discussion.—In the discussion which followed the reading of Mr. Arndt's paper, Mr. Taylor said that the wonderful influence of gypsum in ameliorating stiff and clayey soils should not be overlooked. Many thousands of tons of gypsum had been used at Renmark with the happiest results. Very few Valencia Late oranges were grown in Renmark, but in Mildura this orange had proved even more profitable than the Navel. Several shipments of 1,000 cases of Washington Navel oranges had been made from Renmark to London. It was true that as high as £1 a case had been realised for some of this fruit, but 16s. would probably be nearer the average. Mr. Moss said that at Salisbury the Thompson Improved Navel produced a larger and heavier fruit than the Washington. Being a more solid fruit it would probably export better than the ordinary Navel. Salisbury experience, also, was in favor of a heavy soil for fruit quality. A hearty vote of thanks was accorded Mr. Arndt for his paper, the Secretary (Mr. Lewis) remarking that it was the most valuable ever read before the Bureau.

BORRIKA.

May 9th.—Present: 24 members and seven visitors.

Breaking Horses to Saddle.—The following paper was read by Mr. Geo. Back:—"Horses differ considerably in temperament, and the measure of success which attends the breaker's efforts will depend a great deal on his ability to adapt his methods accordingly. Experience and observation of the operations of a professional are essentials which no amount of theoretical knowledge can replace. Nevertheless, the breaking of an ordinarily quiet-natured, farm-bred colt or filly does not present insurmountable difficulties to a horseman of average intelligence, judgment, and activity. *The Yard.*—It will serve no good purpose here to go into elaborate details of an enclosure designed on purpose for this particular job. The main point to be considered is to be sure that the yard is strong enough and high enough to successfully baffle all attempts at escape on the part of the horse. It should be large enough to enable the breaker to keep out of the danger zone of the colt's hoofs when occasion demands. As most farmers' horse yards are rectangular, it is advisable to put a few rails across each corner. This will greatly facilitate catching operations, and in subsequent manœuvres the colt will not be liable to get the breaker cornered. A stout post set solidly in the ground should be placed near the centre of the yard. It is well to have no projecting ends of rails, or any obstacle which would injure the horse whilst rushing about or falling. *Apparatus.*—The apparatus necessary includes a catching rope about 50ft. in length, strong enough to withstand any neck-pull, and not so large as to be inconvenient for throwing. A steel ring should be fixed at one end, which, when a noose is formed in the rope, will allow it to run freely. A couple of large-sized ropes, about 16ft. long, to be used as leg ropes. A ring at an end of each of these will also be of value. A hobble chain, with a swivel and pair of strong straps. Another piece of chain with a large link at each end, and long enough to reach from the fore-foot to the hind-foot, on the same side, and another hobble strap. A length of strong plough or leading reins, and one or two short pieces of line about as large as is usually required for couplings. An old saddle of any description for the horse to fall about on if he so desires. A strong bridle with neck strap, chin band, and nose band, with a detachable bit. It is advisable to have a proper mouthing bit, with keys in the centre. In any case do not use a narrow bit; it cuts the corners of the mouth too much. For choice, the saddle for the rider's use should have large knee and thigh pads and a deep seat. It should have girth, surcingle, and crupper, all of good quality. The stirrup-leathers should be strong, and the stirrup-irons of large size. When attaching the stirrup-leathers to the saddle, do not raise the latch at the back. By observing these precautions the rider runs less risk of being dragged in case of a fall. For the same reason do not ride in boots with toecaps, low insteps, half-soles, or soles studded with large-headed nails. Elastic side boots are preferable for rough-riding. In all dealings with partly-broken horses remember the motto—'safety first.' Have two or three discarded branbags handy. *Catching.*—I will take the case of a colt which has not previously felt the touch of the human hand since he was branded, possibly some two or three years previously. Get him into the yard along with a handy and docile worker; the said worker having on a pair of winkers with a short rein or coupling attached. Form a running noose, about 12ft. in circumference, in the catching-rope. Stand near the centre of the yard with the noose held in the right hand, and the remainder of the rope coiled in the left. Cause the colt to move around from right to left, so that when the noose is thrown it will fall from behind the horse's head. You will probably not succeed at first throw, but when the cast is successfully accomplished draw the noose tight as quickly as possible. When opportunity offers pass the free end of the rope around the centre post and pull up the slack. Have your assistant (if one is available) frightening the horse from behind. When the colt's head is brought close to the post let the assistant take hold of the rope. Now take hold of the bridle, which should have the bit unfastened on the near side, and the chin strap undone. Stand behind the post and, stroking the animal's face with the left hand, gradually pass the bridle into position with the right. If, during these proceedings, the colt chokes down, immediately slacken the rope. If he falls to the ground it is a good opportunity to fix the bridle, but be careful not to be struck with the fore-feet if the colt endeavors to recover when the bridle is fixed. Next blindfold the horse, using a folded bag, and make sure that he is blinded. Slacken the rope off a trifle, so that he can breathe freely. Now proceed to fix the hobbles and side line. This can be accomplished by putting the before-mentioned quiet horse between you and the colt. Stroke the colt's legs lightly with a stick before putting your hands close to them. Having completed hobbling the fore-legs and fixing a side line between the near fore-foot and the hind leg on the same side, undo the rope from the post and make a hitch under the colt's neck so that the noose cannot tighten, then pass the end of the rope through the near side bit ring, and take away the blindfold. Fasten a bag to a stick about 5ft. in length and quietly flop the colt about the neck, legs, and body, on both the near and off sides. Of course, the colt will endeavor to make off whilst this operation is in progress, but having three legs shackled he cannot get away very fast, and after some time he will become tired of trying to escape and stand. Keep on bagging him until he will let you get close enough to get your hands on him. Then pat him, commencing about the neck and shoulders, and gradually working back towards the tail. If he resents, get the bag to work again, and continue at this until he stands quietly while you handle him. Also raise the tail as though about to fasten a crupper. This handling should be done on the near side, that being the side where the hind leg is shackled. It can be more expeditiously accomplished if the assistant holds the head slightly towards the operator. Now put an old saddle on the colt, with crupper, &c., also an old collar, as it is as well to get him accustomed to these as soon as possible. Handle him on the off side in the same manner as was done on the near side. When he submits quietly, proceed to pick up the legs as required for shoeing, commencing with the fore-legs. To get at the hind legs take a strong piece of rope and form a noose, fastened so that it will not tighten, and placed around the neck just in front of the wither. Now get the colt to put his foot into a loop formed by the remainder of the rope, the end being drawn back inside the noose close to the neck, a turn being taken around the noose so that the leg can be drawn up as the horse kicks, and retained there. Keep at his legs until the colt will allow you to pick up his legs without trouble. Now dispense with the hobbles and side line, and start teaching the colt to lead. *Leading.*—Fasten a pair of driving reins to the bridle and persuade the colt to walk about the yard in front of you. Endeavor to turn him first to one side and then to the other. If he is sulky, give him a spell for a while and then try him again. He will be very awkward at first, but will gradually improve. These exercises will fully occupy the first day. Tie a piece of rope around his neck to enable him to be more easily caught next morning. Take the gear off and let him loose for the night. On the second day get him into the yard again with a quiet horse, and with a little trouble you should be able to catch and bridle him. Only on rare occasions is it necessary to rope the colt a second time. Pick up his legs, as on the previous day. Get the driving reins on again and pull him about as described before. When his mouth has become fairly tractable, it is well to continue the driving operations outside the yard. Have one rope around his neck and through the bit ring. This gives the operator a better chance if the colt tries to get away. It will probably require two men to hold the colt when he is first taken out. When you find that you can stop the colt and pull him to either side as required he will probably lead without much trouble. Take him back to the yard. Select a strong post, preferably outside the yard, and tie him to it by means of a strong rope fastened around the neck so that it will not tighten, and through the bit ring on the near side. Now endeavor to cause the colt to pull back by waving a bag or similar article before him. Do this several times until your pupil has satisfied himself that he cannot get away. Then leave him tied up for a short time. If this lesson is learned thoroughly you should have no trouble in the future with broken bridle reins. The colt's education should now be far enough advanced to enable you to mount him; for which purpose take him into the yard. Mounting a colt correctly takes a little practice, and if you have had no experience in rough-riding, it will pay to take lessons on a quiet horse first. Put the reins over the neck in the usual manner. Take a firm grip of the mane with the left hand slightly forward of a point half way betwixt the withers and the ears. Draw the near rein as tightly as the horse will allow without his backing or rearing. The off rein does not require to be held so tightly. Stand close to the horse's neck and take the stirrup in the right hand. Place the left foot in it so that the ball of the foot is on the bar. Do not place the foot right in. Allow the left knee to press against the horse's shoulder. Grip the pommel on the off side with the right hand. A monkey strap is very handy in mounting. This is a loop fixed to the two front D's on the off side of the pommel, just large enough to allow of a grip being taken. It affords the rider a firm and sure hold. From the rider's position, as already described, it takes only the faction of a second for him to swing himself into the saddle. In mounting a colt for the first time, however, it is well to do this gradually. Raise the right foot slightly from the ground and then come back again several times before finally crossing the saddle. Keep the hands in the positions described until the right foot is in the off stirrup. In dismounting use the same holds and alight close to the horse's shoulder. After mounting, ride around the yard a few times. Then let your assistant open the gate, mount a horse himself, and accompany for a short ride in the open. If the colt is inclined to go quietly, do not bustle him. There is no necessity to make him buck, and if you have handled him well he will probably not do so. At the same time be prepared for emergencies. He will, of course, be awkward to guide during the first few days, but by the exercise of patience and watchfulness on the part of the breaker, the colt will soon become resigned to his fate."

Cocky Chaff.—The Hon. Secretary (Mr. C. W. B. Traeger) contributed a paper. The best method of feeding cocky chaff to horses, he said, was first to sieve out the roughage, and then add for each feed a pint of molasses, sufficient water to dampen it, one pint of pollard, and one pint of scalded oats. One pint of bran could also be added if it were thought desirable. Boiled wheat was too heating. Roughage removed from the chaff could be fed last thing at night.

CLAYPAN BORE (Average annual rainfall, 16in. to 17in.).

May 5th.—Present: 10 members.

Selection and Pickling of Seed Wheat.—Mr. H. Colville read a paper on this subject. In the discussion which followed, the Hon. Secretary (Mr. L. McCormack) explained that smut was a fungus The most effective method of destroying it was to pickle the wheat loose in a trough. If dipping were practised the wheat should be in moderately free bags. Mr. J. Entwistle used the McCabe pickler, and Mr. J. Gray spoke in favor of this. Not only were the grains thoroughly pickled, but the smut balls floated to the surface, and could be skimmed off. The process was slow, however, and ordinarily, dipping in bags was quite effective. After smutty wheat had been put through a drill it should be thoroughly cleaned.

COONALPYN.

May 8th.—Present: eight members and three visitors.

Sore Shoulders.—Mr. A. Samwell, in a short paper, said the best preventive measure to adopt for sore shoulders was to wash the horse's shoulders after it came in from work, and work it with a clean branbag under the collar. The bag should be washed at least every other day, and thoroughly dried before being used. Greasy substances applied to sores collected dirt. The causes of the trouble were feeding too much grain after the animal had had a spell, or working a newly broken-in horse in sultry weather, when it was apt to become overheated. Members thought the advice good. The Hon. Secretary (Mr. G. E. Venning) advised the use of well-fitting collars, the moderate feeding of corn, especially wheat, and reasonable work after a long spell.

FORSTER (Average annual rainfall, 10in. to 11in.).

May 9th.—Present: five members.

Water Conservation.—Mr. J. Searle, in a paper dealing with this subject, said the cheapest and surest method of securing a water supply in this district was by means of a bore. This should be as close to the house and stables as was possible. The drawback with a well was that timber was expensive, and did not last for any length of time. Mr. E. Towill thought a bore more satisfactory than a well. Mr. W. Searle preferred a well timbered with gum. It was a good idea to case the well with iron. To avoid working in water when sinking, he would use a well pump with a 4ft. length of pipe on top.

Cultivation.—Mr. E. Towill thought nothing was gained by ploughing in stubble, as this practice encouraged takeall. Mr. W. Searle would not burn straw if it were wet enough to plough down. Ploughed under in sandy soil it would prevent drift. Mr. J. Searle favored early fallow; his practice was to crop, graze, then fallow.

MANTUNG,

April 9th.—Present: six members and four visitors.

English Lads for South Australian Farms.—Mr. J. N. Baker read a paper on this subject, in which he commended the proposition. Boys of the right type could be profitably employed on any farm. A resolution was then carried in favor of the scheme.

Windbreaks.—Mr. A. Tonkin read a short paper. He had noticed cases in which large areas of sandy country were completely cleared of timber, with the result that considerable trouble was experienced with drift. He thought it wise to leave growing scrub on the tops of the sandhills, and a strip of timber along boundary and division fences where practicable. In this district, even on the stiffer soils, it was advisable to leave timber for shelter to both stock and crops. Mr. Stewart said it was very hard to save mallee, as the scrub burn killed it. Mr. L. Pearce thought mallee took too much out of ground. He advised planting pines in clumps; not in strips. Mr. Hannaford thought pines hard to grow. Mr. Baker would not leave scrub on sandridges. He thought shrubs preferable to trees for windbreaks. Every farmer should plant a few trees each year. Tamarisk was very suitable. Mr. J. P. Tonkin agreed; this plant also provided good stock feed in dry seasons.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

Present: 17 members and two visitors.

Mallee Land.—In a short paper dealing with working mallee land, Mr. G. Gogol advised first firing the rubbish and then picking up and burning any that remained. The land should be ploughed as early as possible and left to the sweetening influences of the weather. Stubble or grass land should be ploughed after rain. Seeding should be completed by the end of June, and mallee shoots cut as soon after as possible. Stiff land should be fallowed early; sandy land, if fallowed, was liable to drift. One member advised the use of the firerake.

PARILLA (Average annual rainfall, 16in. to 17in.).

May 7th.—Present: 14 members and two visitors.

Mixed Farming.—Mr. M. Shannon read a paper, as follows:—"This district is well adapted for mixed farming on account of there being an abundant supply of good water for stock and for irrigation purposes. It is a great advantage to be able to keep stock all the year round and to grow fodder crops for summer use. A portion of the farm should be in crop, a portion fallow, and the balance out for grazing. Oats can be sown on the stubble land that is left out for grazing purposes, and peas, rape, sorghum, &c., can be sown on the early fallow. Lucerne will do well and give a good return in summer with irrigation. Sheep pay well on farms in settled districts, but it is questionable whether cattle would not pay better in this district, as wild dogs are so troublesome. Cattle do not require much attention, while sheep have to be yarded every night. Stock are required on the land in order to keep it free from weeds. It is much better to send these to market in the shape of beef and mutton than to be continually cultivating the land during dry weather. Any good mares on the farm can be utilised for breeding purposes so that losses can be replaced. By keeping a few cows and fowls, which do not require much attention, the domestic requirements can be supplied and the storekeeper's account reduced, but to go in extensively for mixed farming and to neglect the more important factor on the farm, viz., wheat growing, would be a mistake. Where a farmer has already made a good start in mixed farming and has a number of boys and girls to do the work, then he could operate on a more extensive scale, and success would almost be assured." Mr. Lewis thought sheep a better paying proposition than cattle in this district. Dogs were not so troublesome as was generally supposed. Lucerne grew very well in the low-lying country. Mr. Cyril Foale thought it difficult to irrigate any considerable area of lucerne. He advised mixing about 2lbs. of lucerne seed per acre with the super. when seeding, this would provide greenfeed in the stubbles. Mr. G. E. Gregory strongly advocated keeping sheep. Mr. A. J. Stevens thought sheep more profitable than cattle in this district. He advised farmers to sow a good proportion of oats each year to ensure a stubble burn and thus destroy mallee shoots. Mr. C. E. Moyle advised farmers to keep dairy cows and sheep. Breeding mares were also profitable. Mr. J. J. Foale expressed the opinion that sheep were very profitable. They involved little trouble and improved the land. Poultry and dairy cows should also be kept. Mr. J. Gray (a visitor) had found that sheep would do much better than cattle in this district, as the feed was sometimes too short for the latter. The returns from a few sheep would more than pay the interest on the cost of fencing the farm. Pigs, poultry, and vegetables were very good paying lines. Water could be pumped by engine power at a cost of 1s. per 1,000galls.

PARRAKIE (Average annual rainfall, 16in. to 17in.).

April 18th.—Present: 13 members and four visitors.

Afforestation.—Mr. H. Diener read a paper, as follows:—"Tree planting has been sadly neglected in this State. The natural timber has been ringbarked and burnt, and little or none has been planted to replace it. This ruthless destruction of our valuable trees will ere long prove itself expensive. The world's timber supply is diminishing so fast that it is only expected to last a few years longer. At the present time nothing is being done in this State. There are thousands of acres of land along roads and railways which could and should be planted with trees. Apart from their value for timber, their beauty and usefulness as windbreaks and shelter for stock are sufficient justification for planting them. They also help to increase the rainfall. Around Mount Gambier a little tree planting was done many years ago, and the lonely clumps of pines help materially to beautify the district. I do not claim that equal results would be obtained everywhere, but from Murray Bridge and Port Victor to Eudunda and Crystal Brook and Petersburg the soil and rainfall are quite good enough to grow good serviceable timber. Every farmer should plant a few acres of trees, especially in this district. With the sandridges running east and west a good plan is to plant a strip a couple of chains wide across the flats. These break the wind and provide shelter for stock. The sugar gum stands easily first as the most suitable tree to plant. It grows quickly, is shady, when not too young makes good timber, and is very hardy, growing well even in a dry district. The red gum is nearly as good, and stands the frost better than the sugar gum. Pepper trees make good shade and shelter, but are of no use for timber. Poplars would be suitable for windbreaks, as they grow very tall, and a few acres of tree lucerne would always be a help in a time when feed was scarce. I have seen New Zealand swamp oaks in this district doing well. They grow very quickly."

Mr. R. L. Beddome also read a paper. He said—"The question of afforestation is one which is claiming attention all the world over, and is of vital importance in Australia, where the area under forest trees is naturally very small. The forest area of Australia has been depleted at such a rate that already the supply of timber has almost reached the vanishing point. There are other aspects to the tree question, however, which are of equal or even greater importance to this country, and which, strangely enough, have barely been recognised by a great number of people. The connection between trees and rainfall is acknowledged in all the older civilised countries, and it is generally regarded as an axiom that the presence of trees materially increases the average rainfall. In Australia this fact is by no means generally admitted, though it is well known that a timbered country as a rule enjoys a greater rainfall than one which is bare of timber. In the newer mallee districts of South Australia and Victoria it is, of course, impossible to come to any definite conclusion, as a very great area is still covered with scrub. If the present reckless system of clearing obtains for many years we shall probably find that the average yearly rainfall will be appreciably diminished, and everyone must admit that such a result would be disastrous to the prosperity of the district. Surely it would be wise to take advantage of the experience of other countries in this matter, and either leave a certain proportion of the country under its natural timber or else substitute a vigorous policy of tree cultivation. Another and probably the most important aspect of the question, as it affects our own district and other mallee districts with a light and sandy soil, is the necessity for windbreaks for the purpose of checking the drift of sand and for providing shelter for stock and crops from cold and hot winds respectively. As the country becomes cleared of scrub the winds are certain to be more troublesome, particularly in a flat or mildly undulating area, such as that constituting the South Australian mallee. The prevalence of high winds, particularly in spring time and during the ripening period of the crops, has a very detrimental effect on the grain yield; so that it behoves us to obtain for the crop as much shelter as possible. For the purpose of windbreaks and stock shelter the natural timber of the country, viz., mallee, would appear to be at once effective and economical. Tree planting on a scale to be of any practical use would be too expensive to be undertaken by individual farmers, or even by district councils, and would probably tax the resources of the Government. This district hardly lends itself to the cultivation of any really useful timber, though, no doubt, sugar gums flourish when once established, and probably many kinds of pines would do well and prove useful for reducing the wind velocity. The planting of trees to be any distinct advantage, however, would be a very large undertaking and of doubtful success. Of course, many bushes and shrubs could be established which would serve a useful purpose, and would involve a very much less expense than the planting of trees. Tagasaste, tamarisks, African boxthorn, and many other plants will grow fairly readily without much attention, but any purpose served by such bushes would be served quite as effectively and infinitely more cheaply by mallee. The great drawback to the scrub is that it harbors rabbits. In my opinion the simplest and most effective scheme that could be adopted would be for all landowners to retain a moderately broad strip of scrub round each paddock. A mere fringe of scrub or bushes does not offer any serious check to the wind, and would simply encourage the formation of sand drifts. To be really effective the windbreak should be at least three chains wide, and the advantage gained by the protection of the crops from the wind would easily compensate farmers for the additional trouble in coping with the rabbits. By pursuing such a policy we should reap a double advantage—check the ill effects of the wind and also ensure an appreciable amount of timber for the purpose of inducing the precipitation of rain." Mr. Temby did not favor the growing of sugar gums, as they had a tendency to rot off at the ground when about three years old. He favored blue gum for growth and timber, but would not have them for windbreaks as they grew too tall. Pines, if planted thickly, would answer better. Mr. Beelitz grew Aleppo pines, sugar gums, and New South Wales swamp oaks. The lastnamed was the hardiest and fastest grower. Sugar gums were affected by frosts, whereas the New South Wales swamp oak was not. Mr. Diener contended that a tree to serve as a windbreak should be one that grew high. A tree that grew thick and bushy blocked the wind altogether. Mr. Jose favored growing bamboos between pines or gums. These could be utilised as feed for sheep.

PINNAROO (Average annual rainfall, 16·74in.).

May 9th.—Present: 25 members and two visitors.

SANDDRIFTS AND WINDBREAKS.—A paper was contributed by Mr. Josiah Bonnin. He said—"I do not think drifting sand will ever be such a serious matter with agriculturists as it is with some pastoralists. My reason for this belief is that farmers have always a ready means, with their ploughs and drills, of checking it by sowing a crop of some kind. Once a crop starts to grow, and stock are kept off it—and this is imperative—it will soon form a crust of roots and stalks that will check and ultimately stop the drifting sand. With sheep it is different, and unless the drift is fenced off as well as sown it will never be prevented, for the feet of the sheep soon break up the surface again, and should this be on a bit of a rise or hillock, it is just the spot healthy lambs will select to play upon, and break up as bad as ever. Sanddrifts to a pastoralist, in addition to, perhaps, covering up some of his best grass land, are very detrimental to the fleeces of the sheep, much depreciating the selling value of the wool. On the estate that I managed for so many years, I had to deal with small sanddrifts constantly, and learnt, first of all, that it was necessary to fence off the drift, to entirely keep the stock off it. The next step was to sow it with something hardy. I tried several things, amongst them rye and evening primrose. The former was by far the most successful; it usually stopped the drift the first year. After sowing, we left it to seed itself. After about three or four years it would run out, but by that time, what with the old roots and stalks of the rye, and the native grasses and herbs that sprang up, a good surface would be formed, which, so long as the stock were kept off it, would not drift again. Where the drift was upon the face of a hillside that was much exposed to the wind, the method adopted was to strew branches of trees and leave them there; or to dig up the ordinary coarse tussocks of that part and strew or pack them over the surface. In the poorer class of white sand we tried planting marram grass, and this did very well on the low sandhills near the edge of the lake, and formed, as well as a check to the shifting sand, a rough fodder for the cattle when the seasons were late or backward. But this grass, although it would grow in the red sand, was not a success there, and spread but slowly; therefore I do not think it would be a success in this district. It is, besides, expensive to plant, each root having to be put in separately. *Roads.*—Sanddrifts are a great nuisance to district councils by reason of the cost they involve in keeping the road clear, and especially metal roads. I was in one council where, in order to check the drift which was covering the road, we were put to the expense of fencing off the drift and planting it with rye (for the owner of the land declined to do this), besides the cost of scooping hundreds of tons of sand off the metal, which was on the main road to the Wellington Ferry. Before leaving the subject of drift sand, I am of the opinion that it would be wise to leave strips of mallee growing on the poorer sand rises to act as windbreaks. These would check the drift—likely enough, prevent it altogether—besides forming a shelter for stock and fuel for the future, when the mallee is scarce, as most assuredly it will be in the not very far distant future. *Windbreaks.*—It is unnecessary for me to point out to you how useful shelter is for both livestock and trees, if they are to be grown profitably. All I can do on this subject is to let you know the names of the trees I have had planted and grown on an exposed sandhill near the shore of the lake, for both ornament and protection to the homestead, and to tell you how they succeeded. Those trees that grew and did best, and I name them in the order of success, are, first the tamarisk, the pepper tree, lagunaria, white cedar, hardshell almond, myoporum, some sugar gum trees, and a tree named phytolacca—the latter is an Algerian native, I believe, which grew up into fairly shady trees. The pine trees were *Pinus insignis* (Remarkable pine), *P. Canariensis*, *P. Maritima*. The pines were very slow in growth, never reached any height, and only did moderately well, and did not appear to appreciate the strong west and southerly lake winds; the best, however, were the *Canariensis* and *Insignis*. The *P. Maritima* were a disappointment, for we had hopes that these would do well, as they flourished on the sand dunes on the west coast of France; but those we tried were straggly, poor specimens, neither useful nor ornamental. The trees that suited the locality best were the tamarisk, and they did very well indeed, and there is one now growing that must be about 25 years old with a short trunk pretty well 2ft. in diameter. I believe that on Hindmarsh Island the tamarisk has been tried as a hedge plant. This tree is very easily grown; it only needs the young green shoots to be stuck into the ground when it is wet. The next most successful tree was the pepper; it did very well, but was mostly of a straggly growth, and very hardy, if not very ornamental. It is, however, a great robber, and extends its roots a great distance in search of moisture. The *Lagunaria* grew fairly well; they were hardy and pretty trees, but scarcely suitable as shelter trees, and were comparatively slow growers. The white cedar did well and was an ornamental tree. My successor has planted a few more since I left the estate, but this tree can hardly be called a shelter tree. The *Myoporum* (otherwise named on the sea coast as the 'cockatoo bush,' for some unknown reason) did very well; it is very hardy and an evergreen, and might be useful as a shelter plant. The hardshell almonds did very well and were hardy, and make good stocks for peach and nectarine, and, I believe, apricot grafts. I had some peach and nectarine grafts put on to one of our almond stocks by a professional gardener, and they did very well indeed, until they were one day wrenched off by a heavy south-west gale of wind. We had a couple of fig trees that did well and bore delicious fruit. There was also one mulberry tree that did fairly well in a sandy hollow, but the birds had most of the fruit. The whole of these trees, with the exception of the mulberry, were grown on a whitish-grey sandy rise, and I feel perfectly sure they would mostly all grow well in this district, where the sand and subsoil is much superior to that of the sandy rise mentioned, and with a very similar average rainfall of about 15in." Members evinced much interest in the paper. The Chairman (Mr. P. J. Edwards), in urging the importance of planting trees, said his experience was that sugar gums were easily the best for stock shelter in this district. These were more rapid in their growth than any others he had tried.

WILKAWATT (Average annual rainfall, 16in. to 17in.).

May 9th.—Present: 20 members and four visitors.

GREEN FODDER IN MALLEE LANDS.—Mr. M. Neville read a paper. He said—"It is not necessary for me to emphasise the need for green food for all classes of stock on the farm, especially during the dry periods of the year. For a summer crop I prefer lucerne, which can be profitably grown on almost any class of mallee soil. We have been very successful with a plot of this fodder on the side of a white sand rise. From October till May we have had six cuts, the second and third cuts ranging from 2ft. to 2ft. 6in. in height. In a favored spot it reached a height of 3ft. A piece of red sand would have produced at least two cuts more during the same period, and the labor entailed would have been 25 per cent. less than on the white sand. For convenience in irrigating I prefer a gentle slope; this, at the same time, answers admirably as a drain, which is important in lucerne cultivation. Farmers in new country, who are about to lay out a homestead, should place the bore at the top of a red sand rise. if it is possible, and reserve a good area of this for growing fodder crops and for garden plots. For lucerne, one essential is a perfect seed bed; well-worked fallow being admirable. Before fallowing dress the land heavily with stable manure, and all weeds germinating from it can be destroyed. The end of July, the following year, should see the fallow worked lightly, after it has been thoroughly rolled and a liberal dressing of superphosphate applied. Grade the plot as soon after as convenient, and form a small bank on the three low sides, to prevent waste of water. This being done, work lightly and sow evenly over an acre 10lbs. of South Australian harvested lucerne seed, which will make a nice thick crop. Cover the seed with at least 1in. of soil. When it germinates on the surface it never stools as well as the plant that has a firm root hold. Good fallow will contain an abundance of moisture to germinate the seed and maintain the young plants until late in the spring, when the plot can be irrigated without fear of loosening the roots. When the crop is about 6in. high mow it and leave it on the ground as a mulch. When the next growth is nearly ready to cut, start watering at the top of the slope. I usually irrigate four days or a week before cutting (as advised by Mr. Colebatch), and find that when the crop is removed the next growth is already 2in. to 3in. high, thus saving at least a week, and little or no evaporation takes place. It is necessary to irrigate again when the young crop has fairly covered the ground. If the land has been graded before seeding there is no trouble in flooding the plot from the top. The best indication as to when the crop is ready to cut is when the lower leaves turn yellow. One cannot always depend on the flower in cool weather. Rust spot disease (which we have experienced and which I should say is common) can thus be guarded against, for the yellow leaves are the first effects of the disease. One early cutting will wipe the disease out of the plot and leave it healthy. At the beginning of each spring a good dressing of manure (fowl manure can be used) should be worked into the ground with the harrows, and a 2in. mulch of short stable manure applied all over. In the winter months, when the lucerne is lying dormant a quick-growing, early-producing crop of green-food is needed, and it would be hard to find a crop more prolific than mangolds. They supply an enormous quantity of leaves, which can be stripped about once a fortnight. When the lucerne comes on again in the spring the mangolds themselves can be fed to the stock; pigs and poultry are particularly fond of both leaves and roots. These can be grown either in the garden or on the fallow without any trouble.. A moderate dressing of any manure will result in a profitable crop, and the land will be enriched by the mangolds. A good breakwind is half the battle in growing any vegetation, and can be satisfactorily constructed with a few loads of mallee stumps." Mr. P. Maher thought the Yellow Globe mangolds best to grow in this district.

WINDBREAKS AND STOCK SHELTERS.—Mr. W. J. Bowman read a paper. He said—"After five years' residence in this district I am more than ever convinced that windbreaks are an absolute necessity. From year to year, as the clearing of the mallee goes on, the country will become more subject to the sweeping winds of which during the past two years we have had experience. Those settlers who were wise enough to leave a good clump of scrub around their homesteads can fully realise the benefit of protection from the dust during the summer months, the keen cutting east winds, and also the squally south-west winds. Many of us, when clearing our land, made a very great mistake in not leaving clumps of mallee studded about in the paddocks, say on sandhills, as shelter for the stock. Stock-raising will not be the success it should be here until protection from the weather is afforded them. Road breaks should be preserved until something better can be substituted. The Government acted wisely when surveying the country by leaving the road or windbreaks, but the roads should have been laid out in the centre of the breaks. Had such been done, occupiers on both sides would have had the benefit of the break. As it is now one occupier has all the benefit and the other none. The labor involved in the destruction of vermin would have been equally divided also. The time is to come when the stockholders will realise that they must go in for a system of tree-planting to provide shelter for their stock, and if the present windbreaks are destroyed it will be necessary to replace them." Mr. McAvancy believed that the windbreaks on the roads were too wide. They should be narrower, on account of harboring vermin. He did not like the mallee shelters, but favored planting ornamental trees, such as sugar and blue gums. Mallee gave little shelter in summer. Mr. D. F. Bowman favored the idea of planting trees in the centre of paddocks. Almonds would do well and also be profitable. Tamarisk and boxthorn were suitable. Mr. J. Ivett said boxthorn made a good breakwind, but it spread too quickly and would probably become a pest. Mr. W. J. Bowman thought there was no necessity to plant a hedge as a breakwind, trees 10ft. apart was all that was required. Mr. M. Neville thought the gum the most suitable tree. A visitor suggested silver wattles. Mr. A. Neville suggested Port Lincoln wattles, and Mr. J. Cushion thought the best breakwind a farmer could have was a stack of straw in the paddocks, and so shelter the stock as well as feed them. Messrs. Neville Bros. are carrying out manurial experiments in regard to quantities; a committee of five were elected to watch proceedings to ensure accuracy.

CLANFIELD, May 9th.—POULTRY.—Mr. A. T. Franklin read a paper. The selection of a good breed, he said, was an essential for poultry for the farm. White and Brown Leghorns were, perhaps, best for egg production, whilst for the table the Black Orpington-Indian Game cross was recommended. Houses with good ventilation on a dry, sandy site were needed. The pens should be cleaned once a fortnight. A number of remedies for different diseases were recommended.

GERANIUM, May 9th.—Mr. W. J. Mitchell read a paper on "Fallowing." He did not think it wise to work new land much, as excessive stirring would not sweeten it and put it in heart. Sunshine and air alone could do this. On all new land in the mallee this could be laid down as a broad principle, and it was not until a crop or two had been reaped and the stubble burnt that the land would respond to heavy cultivation. Even then, apart from a ploughing and one cultivating, the harrows was the best implement to use.

FODDER GRASSES.—At a previous meeting Mr. F. Norton delivered an address. He advised sowing grass seed on well cleared and prepared land. When the Geranium country became clear of stumps, &c., pastoral pursuits would play a large part on the farms in conjunction with agriculture. In this locality it was advisable to sow grass seeds in the autumn. The grass was then well established before the frosts and later the hot winds were likely to affect it. The seed should be sown lightly and brushed over with bushes or bags tied behind the drill, and then rolled. Lucerne, he considered, was the best fodder to plant, and then in order of relative value rye grass, Melilotus, *Orzyopsis*, and Bokhara clover. He had applied potash, bone super., blood manure, and basic slag, and had been satisfied that it paid to manure grasses. Mr. Mitchell had found it better to sow a small area of clover and attend it well than to put in a larger acreage for stock to graze on at random. Barley was not a suitable cover crop for lucerne. Mr. Jacobs favored distributing the lucerne seed over a wide area.

MORGAN, May 9th.—Members discussed the proposal of the Government Geologist that information regarding underground water supplies throughout the State should be tabulated. It was unanimously agreed that this data would be very valuable to landholders, and the hope was expressed that farmers would facilitate the collection of the information.

WYNARKA, May 16th.—SEEDING.—Mr. Colton advised sowing from 40lbs. to 45lbs. of seed per acre, according to the variety of wheat being sown. Mr. C. Schultz said Gluyas should be sown at the rate of 60lbs. per acre. Mr. J. Boyce advised sowing shallow.

Mr. Bartlett preferred deep sowing. Mr. Colton thought 45lbs. of super. per acre sufficient for new burnt land, whilst Mr. C. Schultz recommended 80lbs. It was generally agreed that if oats received heavier dressings of super. in this district better results would be secured from this crop.

SOUTH AND HILLS DISTRICT.

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

May 18th.—Present: 20 members and three visitors.

Harvest Results.—Members reported on the harvest for the year just closed. Mr. A. A. Magarey said—" My trees are only in their fifth year, and not much can therefore be expected from them. The stone fruits gave the best results. Of these the Elberta peaches and Moorpark apricots were a long way ahead of the rest, the fruit being clean and of fair size. Of the apples the Rome Beauty and Rokewood gave the best returns, although they were somewhat affected with codlin moth. Cleopatras (mainly those shaded from the morning sun) were also affected with the scab. No preventive measures were taken in either case. The peach and apricot trees were sprayed with Bordeaux mixture for curl leaf and shothole, and this effectively checked these diseases. About 30 trees were sprayed with Bordeaux powder, and the result was equally as good, if not better than with those treated with the Bordeaux mixture. The former is cheaper and more easily handled. I intend trying it again next season, and if it is satisfactory I shall use it exclusively. A variety, which I think is new to this district, fruited this year, namely, the Glengyle Red. The growth of the tree is very similar to that of the Rome Beauty, and the fruit ripens about the same time, but is somewhat different in shape, and of a dark-red color." Mr. G. W. Summers reported that—" The fruit harvest for 1913-14 has been fairly good. Stone fruits were not as good as usual, nectarines, especially, being short. Pears, with the exception of Josephine, Capermont, and L'Inconnue were practically a failure. Apples in most cases cropped heavily. Owing to the dry winter, practically all fruit was on the small side. The outstanding feature of the apple crop was the unprecedented attack of *Fusicladium*, which practically ruined the crop of Cleopatra, although my orchard was not so badly attacked as many others. Two sprayings of Bordeaux mixture were applied, which partially stayed the ravages of the disease. The spraying was not done until the first appearance of the blight. The apples exported were Cleopatra, Dunn's Seedling, Jonathan, and Strawberry Pippin, the larger proportion of which were of the 2½in. grade, but few were 3in. I have fruited the apple ' Senator ' this season and think that it will prove to be a very useful variety, being of good color and flavor. The rough and careless way of tearing off the fruit, with fruit buds attached, means a very serious loss. Certainly it has been a little bit difficult at times in some varieties of apples to get them off without the bud, this no doubt being caused by the dry season, there being a lack of sap in the trees. There has also been a very uneven ripening of apples this year, some failing to mature weeks after they have been picked." Mr. A. R. Ashby said—" Our fruit crop this year has been very satisfactory on the whole. The size of the apples has been good ; averaging 2¾in. The Jonathans bore well, especially in the cases where the laterals have been left long. The fruit on the young trees filled out well, but was not quite as clean as that on the older trees with heavier crops, where they were practically free from codlin moth, black spot, and bitter pit. The reason for the fruit on the five-year-old trees not being so clean was that they were cut back fairly hard in the winter. Consequently they made vigorous growth in the spring, which prevented the spray from reaching the fruit. Jonathan apples exported ranged in size from 3¼in. to 2¼in. A 2¾in. Jonathan is a very good apple to pack. We used the combination case, with corrugated cardboard for the top and bottom. The fruit was packed on the diagonal system. The Cleopatras cropped very well. They were of a splendid size, averaging 3in., but the young trees were affected with black spot and bitter pit. Bitter pit was worst in the case of trees which had been severely pruned. Old trees were practically free from it, except the terminal bunches on the leaders which had been cut. We gave the trees the first application of Bordeaux mixture at the time of the second spraying for codlin moth. If it had been applied between the first and second sprayings for codlin the fruit would have been practically free from black spot. Rome Beauties yielded a light crop. The fruit was of good size and free from bitter pit and scab. The terminal buds on the leaders all developed into flower buds, which bloomed a month earlier than the normal flowering time, and set seven or eight in every bunch. This had the effect of checking the growth of the trees, bringing the limbs out and letting the light into the centre, and should so improve the buds for next year. The fruit on these leaders developed very quickly, and it was fit for picking and packing by February 24th. The Rokewoods cropped heavily and have filled out very well in the last few weeks. They are of splendid color and free from disease." In Mr. J. Turner's orchard, which consisted chiefly of Cleopatra apples, the crop was a complete failure. Bitter pit and *Fusicladium* affected the fruit badly, and he had come to the conclusion that, on account of the amount of spraying that had to be done, this variety was not profitable. Although the trees were sprayed with Bordeaux mixture as the buds were bursting, and twice after, it proved a waste of time. A late brood of codlin moth attacked the apples, particularly Jonathans, just before they were ready to pick. Glengyle Red, a sport from the Rome Beauty variety, but more highly colored, less conical, but more flat at the apex, fruited for the first time. Fruit from a grafted tree in a damp spot developed bitter pit very badly, but this might have been attributable to the strong growth. Mr. L. Winser said the crop was satisfactory considering the nature of the season and the difficulty in getting the soil to a good tilth. *Fusicladium* was the cause of most trouble, but he had sprayed the trees when they were blossoming, with fair results. Arsenate of lead was applied four times to destroy codlin moth, and the effect was good. The majority of the apples exported were of 2½in. diameter, ranging from 3in. to 2¼in., the varieties being Jonathan and Cleopatra. Beurre Clairgeau, Glou Morceau, and Madame Cole pears also were shipped. The majority of the members disagreed with Mr. Turner's remarks regarding Cleopatra apples, and considered this variety the best for the district. It was more liable to be pitted when grown in damp spots.

CHERRY GARDENS (Average annual rainfall, 35 03in.).

May 5th.—Present: 12 members.

Preparing Hides and Skins for Market.—Mr. T. Jacobs, sen., contributed an instructive paper on this subject. Hides and skins carefully prepared always command a better price in the market, he said, than those carelessly handled. The hide should be carefully removed from the beast, and on no account should it have holes cut through it or be scarred. It should be spread out flesh side upwards and liberally dressed with crude salt. It should then be folded lengthwise, the two edges meeting in the centre; the folding should be repeated, the hide rolled from the neck, the tail being used as a band. the hide then being placed in a bag and hung to drain, and marketed as early as was convenient. Calf skins should be treated in a similar manner. Sheep skins should be carefully hung lengthwise over a rail, wool downwards, and left until quite dry, when they should be promptly marketed. When skinning a fox, it was necessary to open the skin from the extreme point of the chin, along the belly, to the tail, and from the inside of each foot to the former opening. Skinning should commence from the front legs and head. Gristle should be removed from the ears, as this prevented their drying quickly. When the skin was off the head, it should be worked off towards the tail. The skin along the tail should then be opened for about 2in., the skin being carefully worked off to that point. Then, by gripping the tail tightly between the third and middle fingers, and placing one foot on the carcass, the skin could be pulled off to the tip of the tail without further opening. The advantage was in that it was easier to open the skin of the tail without damage after it was off. For stretching and drying a board 5ft. by 3ft. would meet requirements. The skin should be placed fur downwards on this. The front feet should be extended to a point level with the point of the nose and as wide apart as possible, and secured by a 2in. wire nail in the point of each. A similar nail should be placed in the point of the nose. The body of the skin, behind the front legs, should be similarly secured to the board, there being equal distances between the nails on each side. Each end should then be nailed across, the skin being stretched to its fullest extent. The tail should be secured with one nail at the extreme tip. The skin should then be hung in a shady position until dry. For skinning rabbits, first a cut should be made behind the ears, and another between the hind legs, close under the tail. From this opening the skin should be turned forward, and with this in one hand and the hind legs in the other, one vigorous pull would clear the skin. The skin should then be stretched fur inwards on a bow of fencing wire and attached to a wire in the shade with clothes pegs. Rabbit skins should be marketed in a compact bundle, tied with binder twine. Domestic cats could be skinned in the same way as foxes, except that the head was not required. Members agreed with the ideas of the writer of the paper.

IRONBANK (Average annual rainfall, 33in. to 34in.).

May 9th.—Present: six members and four visitors.

SPRING CABBAGES.—Mr. W. Slater read a short paper, in which he advised saving the best cabbage stumps, from the second cutting, for seed. Seed should be sown about March 10th, in a position where the plants would get the full benefit of the sun. If thrip appeared on the young plants, they should be dressed with a solution of two handfuls of sulphate of ammonia and 4galls. of water. They should be ready to plant out about the first week in May. The bed should be dug to a depth of 1ft., and heavily manured. The plants should be 18in. apart and the rows 22in. apart. Six weeks after planting they should be hoed and lightly dressed with ammonia. The hoeing should be repeated two months later, and when the plants began to make hearts about 1cwt. of ammonia to each 1,000 plants should be applied.

KANMANTOO (Average annual rainfall, 17·90in.).

May 9th.—Present: eight members.

THE FARM HOME.—The Hon. Secretary (Mr. H. R. Shepherd) read a paper, from which the following is extracted:—" In this district it is difficult to make a homestead look attractive, owing to the unsuitability of the soil and climate for growing the more ornamental shrubs and trees, only a few varieties of gums and pines doing at all well. However, we might improve the look of our properties by planting the few varieties of trees that will grow. When they have attained maturity they will come in for posts and firewood, as well as affording shade and shelter for stock whilst they stand. We should have no ungainly looking sheds or rubbish heaps close at hand, as they are only a breeding ground for vermin. Good sheds and yards improve the look of a place considerably, but these should be removed some distance from the house, but not at an inconvenient distance. Stables, &c., should be at least 100yds. from the house and on the side away from the prevailing winds. Great care should be taken when planning a home to so build the house and sheds that they can be added to at any time without inconvenience. Keep the house, sheds, and gates well painted, as this not only improves the appearance but adds very much to the durability of the timber. I prefer good hedges around the home, but they involve a considerable amount of work to keep them trimmed. It is most essential to have good gates properly hung. We might all make farm life more enjoyable if we worked more systematically, by keeping our machines and tools in good order and in their proper place. Always buy the best machines and tools, as a good implement more than makes up the difference in the price in the end, and it does more satisfactory work. Have a place for everything, and when finished with a machine or tool always put it in its place. One of the most interesting, as well as helpful and instructive occupations is the experimental plots. Where one has time it is well to carry on a considerable number each year, as everyone should know what to use on his land and how much he can use. The time must come, and is not at all distant, when the land will have to be worked more scientifically, and it behoves the young men of South Australia to make a shift in this direction, as through a thorough knowledge of the soils and manures they will add considerably to their own incomes, as well as benefit the State generally. Any person attempting to take up experimental plots must go to some little trouble, weigh seed and manures properly and book all results as a reference on which to work at a future date. Even if we do not make it pay, it renders enjoyment and varies the routine of our daily work. Farming is one of the most healthy occupations, and why should we not make it as enjoyable as any other by each attaining a thorough knowledge of his own particular branch and by having a reasonable amount of recreation."

MACGILLIVRAY (Average annual rainfall, 19in. to 20in.).

May 5th.—Present: seven members and one visitor.

FERTILISERS.—The Hon. Secretary (Mr. H. C. Williams) read the following paper:— " A good deal of public attention has been given to fertilisers recently, and it would seem that to practise true economy in this item careful discrimination is necessary However it might be in the drier parts of the State, the practice of using mineral super. exclusively does not answer in this locality. In choosing our manures we are guided by the requirements of the different crops, the nature of particular soils, and other factors. Minute experiments do not appeal to the average scrub farmer, but there is room for something in the way of manurial tests with barley on light soil. In Germany potash is considered essential for barley crops. Of any soils, those of a light nature should respond to this fertiliser. Some local barley growers use expensive nitrogenous fertilisers, such as top dressings of ammonia. Equal success is won by other growers with guano super. Unless it is intended to harvest the barley with the binder or reaper-thresher, nitrogenous manures, by making too much straw, may cause heavy loss at harvest time. Last season I used 1cwt. of guano super. and 1½bush. of Prior barley on fallowed dark loam. The crop was thick and lodged badly, and probably would have been worse still if bone super. or ammonia had been used instead of guano. Bone super. at the rate of 1cwt. per acre, under similar tillage and soil conditions, produced a good yield of wheat. Oats sown on narrowleaf country with 1cwt. bone super. failed to make stubble enough for burning. It is doubtful whether manure of any kind will do as much as tillage to secure a burn on shoot land. Peas—2bush.—and ½cwt. guano were drilled in during August. The peas podded better than some which were sown with 1cwt. the previous season, and planted much earlier than last year's crop. For hay I prefer bonedust or bone super., which, used at the rate of 1cwt. both on fallow and after peas, gave a good cut last harvest. Peas as manurial agents are well known. They can be left until after the barley is planted and sown at the rate of about 2bush. per acre. Wild turnip is one of the pests with which they associate, and it is advisable to put a quick growing crop on land lately held by peas, so that all rubbish shall be outgrown." During the discussion it was stated that bone super. had failed to show special results for the year of application, but feed showed the benefit later. Potash manuring had not shown any difference at sight in strips sown alternately with plain super. Nothing accurate could be estimated, however, unless scales were used in checking results. The season following its use land had shown the advantage of a 1cwt. dressing, as against ½cwt. Standard 36-38 super. was shown to be cheaper than guano per unit. The guano was not as soluble.

MOUNT BARKER (Average annual rainfall, 30·93in.)

May 6th.—Present: 45 members and two visitors.

Management and Feeding of Poultry.—Mr. E. F. Stevens read a paper, in which he said:—"*Selecting Stock.*—Whatever kind of fowl the novice takes up let it be a pure breed, as a high standard of laying cannot be attained by a system of breeding that causes the mingling of bloods. Only by careful selection and keeping the blood line pure can success be hoped for. It is absolutely necessary that the very best stock one can get within a range of fair and reasonable prices should be secured. In looking for laying qualities in a hen one cannot go far wrong if the following are noted:—Movements active and alert, fine in bone, but not frail. What is meant by fine in bone is bone in fair proportion to body. Sometimes we see hens with shanks quite double the thickness they should be, and in those cases the hens are coarse throughout; the breast bone is long, pelvic bones hard and coarse and set closely together, and the head is invariably coarse and heavy. These show no breeding and are poor layers. The hen with the fine bone usually possesses a fine, snaky head, sharp eye, comb and wattles fine in texture, and in the case of the small-combed variety, the heel of the comb does not follow the arch of the neck, but takes an upward cut. The breast bone is short and straight, and free from flesh. The pelvic bones are soft and pliable, and set well apart. The latter is not so important as the former, but the pelvis must be soft and free from fleshy substances or fat. I would suggest that, if you are going to select your breeding hens from your present stock, make your selections on a dark night when you will not be influenced by anything other than the sense of feeling. In the absence of any knowledge in regard to any hen's breeding or laying powers such a course would be preferable to any other method you could adopt. Hens often have peculiarities, such as a light faltering step when alarmed; they will stand on one leg and hesitatingly bring the other to the ground. This I have noticed is a very good sign of heavy laying and sound constitution, and the pullets or progeny of such a hen usually prove themselves good layers. It will be noticed in any photo. of a pen of hens which have given an extraordinary yield of eggs for the year that several of them are standing on one leg, with the neck stretched in an alarmed attitude. The beginner should be observant and content to improve on his initial stocks if they come under the heading of 'fair,' and should refrain from purchasing from outside blood after the first year's mating. The motto should be—'Keep the virtues of the blood intact, and improve by selection.' Do not expect every egg that your best hen lays to produce a strong chick, or every pullet to be as good as the mother, or start to lay before she leaves the brooder, for there are many other deteriorating influences at work. There is the fact that fowls bred naturally for thousands of years before they were domesticated. We therefore cannot expect to accomplish in a few short years by scientific breeding methods what Dame

Nature has been doing for thousands of years. The beginner should work on his own judgment as soon as possible, and richly benefit by failures, thus realising the truth of the old saying, 'that experience is the best schoolmaster.' Pullets should on no account be used as breeders, and the cockerel should be well matured when mated with aged hens. The use of immature stock (either male or female, or both) is the chief cause of small eggs, and I have proved that the weight of eggs can be reduced from 28ozs. to 19ozs. to the dozen in two generations by using pullets as breeders. I have also proved that aged hens laying rather small eggs, say 20ozs. to the dozen, mated to a cockerel bred from a hen which was a layer of large eggs, invariably gives progeny that will produce eggs with a considerable increase in size. This then is an important point, and great care should be taken. The male bird should be from the very best hen one can secure from type and egg-laying point of view, because of the fact that the male bird exerts a greater influence than the hen. Particularly is this so in the case of the pullets, and a good hen's qualities are not usually found in her daughters, but in her grand-daughters given through her son. *Heavy or Light Breeds.*—There is justification in asserting that there is a widespread reaction set in in favor of the light breeds. This seems to obtain throughout the Commonwealth, and particularly throughout the eastern States, and if the data supplied by the other States can be accepted as evidence of the general trend of popular opinion, breeders are beginning to realise that more attention will have to be bestowed on the table side of the industry. The scarcity of prime table birds and the attractive rates that they realise in the open markets almost all the year round, can do little else than hold the attention of the man ready to make the most out of his poultry. Whilst I am fully cognisant of the fact that the White Leghorn will ever dominate the situation in regard to the annexation of prizes at laying competitions, that is not all, for when one sets out to keep poultry on a commercial scale large flocks of young fowls have to be handled each season, and usually more than 60 per cent. are cockerels. The difference in market value will be found fully 50 per cent. in favor of the heavy breeds. The hens are more saleable when their term of laying is completed, which in itself is only a small item as compared with the advantage of having a class of fowls that is easily shut in or out, as the case may be. Whatever breed is taken up it must be remembered that like begets like in a general way, and if you do not have the good qualities in the parent stocks you cannot reasonably expect to produce well-bred or profitable birds. The foundation stock of even a small plant should be the very best obtainable. If you start well you will secure year after year birds that will show their breeding and will be a source of pleasure and profit. *Sanitary Conditions.*—Good sanitary conditions must always obtain. This should be made one of the cardinal principles of management. Clean out the roosting places frequently, and keep vermin in check. Kerosene is most deadly to all sorts of fowl vermin. See to it that fresh water is supplied at least once a day; especially is this necessary in windy weather, as dust will most readily contaminate water, and the drinking vessels should be thoroughly clean ed out two or three times a week. Small vessels are preferable, as large ones may be neglected, and the mouth and throat slime dropped by the hens in the act of drinking falls to the bottom of the vessel and is a hotbed for germ life. Especially is this so if any fowl is suffering from a throat trouble. I have found Epsom salts good. Use one packet to three gallons of water once a week. To tint the water once or twice a week with Condy's crystals is also good, and entails very little bother. Provide a dust bath in each yard, and also plenty of shell grit. Sponge scaly legs with kerosene, as clean legs add greatly to a bird's appearance and usefulness. No other industry offers such good profits for the capital invested as the poultry industry. In arriving at a decision as to the breed of fowls to keep quite a number of things has to be considered. Local climatic conditions are in favor of the heavy breeds, and these will, as a rule, give a preponderance of pullets. The cockerels and hens are more saleable. The eggs are brown-shelled. The birds lay well in the second year, and are often profitable in the third. They are handy for hatching, rendering a machine necessary only for a short time in early spring. They do not require such high netting yards, and are greater vegetarians than the light breeds. This is an important item where an abundance of greenfeed can be grown, as it means a great reduction in the feed bill. There is no better time than the present to make a selection of breeding hens. Those still carrying their old feathers and still laying are the only worthy specimens for the breeding pen. They often present a very scraggy appearance, being minus neck feathering and are bald headed, but still have plenty of color. This is one of the surest signs of strong constitution. If mated with a cockerel bred from a hen of similar quality they cannot fail to produce heavy layers. The cockerel, in addition to possessing the above-mentioned qualities, should have a smooth comb and large wattles—large wattles denote breeding—and he has the power to transmit his mother's qualities to his daughters. Stocks bred from such mating will be found good autumn and winter layers. *The Feeding of Young Stock.*—Feed for young stock should be bulky, and from chickenhood they should be forced to extend their crops. The use of the more concentrated foods should be avoided, as the laying hen must have a stowaway, just as a dairy cow must have a good barrel. Feed mash in the morning consisting of three parts greenfeed, two parts pollard, and one of bran. The greenfeed should be chaffed and moistened with water, in the absence of milk, or meat-meal soup. Then dry off with the bran and pollard. Spurted oats or barley at noon, and wheat, oats, and peas in rotation at night. Feed the evening meal early, and feed with chaffed greenfeed before the birds roost. This will be much appreciated by the fowls. If one has not the time to mix mash in the morning, feed the bran and pollard dry. This can best be done by cutting a kerosene tin from side to side about an inch from the bottom, by pressing the top portion in and the bottom out, thus making a slot or trough into which the feed trickles as the fowls use it. This acts splendidly if fed under cover, but if in the open it must be rendered waterproof or the food clogs and ceases to run. When this style of feeding is adopted use plenty of greenfeed at noon. The best greenfeed is lucerne chaffed, then comes cabbage or kale, green barley, mangold wurzel, silver beet, or maize. I am of the opinion that mangold, if put through a mincer and reduced to a pulp, would prove a splendid food to dry off with pollard and bran—this I intend to try. Sieve all your fire ashes and crush the charcoal, and feed this with the mash. There is nothing better to keep them healthy and hungry. Keep all breeding stocks on a hard grain diet, as stronger chicks will be hatched. If a vigorous cockerel is placed with a flock of hens until about 4 o'clock in the afternoon, and then placed with the stud hens for the rest of the day it will be noticed that he will throw more pullets than cockerels. This I have proved beyond all doubt. The eggs should be handled carefully when gathering from the nest, and it will be noticed that those eggs having a thin shell or that produce a metallic sound when rubbed together or in the palm of the hand, are infertiles, also eggs dropped from the roost at night are infertiles. The eggs with smooth solid shells will invariably prove the best hatchers. Misshapen eggs are 'clinkers,' seldom fertile, and rarely hatch. I have proved, to my satisfaction at least, that mental suggestion is a factor that has to be counted with in breeding fowls, and that birds of various breeds should not be in sight of each other during the mating period. To me this explains the reason that the man who runs one breed only can excel, and the man who takes up several breeds and pens them side by side is often confronted with many freaks and miss-typed birds. One of the most important points for the breeders of the future is the breeding of a class of fowls that will lay for several years at a profit. This breeding of young stock each season to take the place of last year's birds is costly and fraught with many risks due to chicken mortality through the various epidemics. I consider that one of the most pressing needs in connection with present egg-laying competitions is the inclusion of a section for second year and even third year hens. These I am sure can be bred, but not on the same lines as the sprinter, or those that lay the bulk of their eggs during the first year. Tests in the eastern States have shown that the pens that won handsomely through the first year did not lay the most eggs in the aggregate when the second year was taken into account. I will conclude by expressing my wish that a resolution go from this Branch to the Poultry Expert, recommending that a second year test be instituted at the next year's competition."

MYPONGA (Average annual rainfall, —in.)

May 6th.—Present: eight members.

INTRODUCED FODDER GRASSES AND CLOVERS.—The following paper was read by Mr. J. Muller:—" In dealing with this subject I will endeavor to describe what I have found best suited to this district, and what might be classed as good utility fodder plants. In grasses, as in all other herbage, there are two classes, namely, annual and perennial; but as I have tried only perennial and have seen only good results from two annuals, I will deal chiefly with perennials. The two annuals mentioned are White Dutch clover and *Trifolium subterraneum*. Both these clovers do well in cool wet districts. Besides these two there are the cow grass clover and lucerne. White Dutch clover does best on wet soil, and will grow well into summer if the soil is damp. It does not grow very high, but forms a thick mat, and will stand grazing better than most clovers. It is much relished by all kinds of stock, especially sheep, which do exceeding well on it. One prominent grower in this district prefers it to lucerne. *Trifolium subterraneum* also does extra well, but it does not stand the warm days of spring like the White Dutch. It has the peculiarity of burying its seed, so there is no danger of stock eating it out. It thrives on almost any kind of soil, particularly on rich soil. In the Blakiston district, which is similar to this, the carrying capacity of sheep is now two and a half per acre, whereas it only carried one before the introduction of this clover. As the seed is rather expensive, it is well to include it in a mixture, and in about two or three years it will spread all over the paddock. Cow grass is a perennial, and is very much like lucerne in its habits. It will stand grazing, and will keep green right through summer without irrigation. It is the best artificial clover I know of where irrigation is impracticable. Unlike the *Trifolium subterraneum* it will not spread of its own accord, and requires to be sown at the rate of about 10lbs. per acre. The seed is not very expensive, costing about 1s. per pound; so that for a small sum a good crop of excellent fodder can be had in a few months after sowing. The three clovers mentioned require about the same treatment and time of sowing. Work up the ground, which should be fallowed the spring before sowing to a good tilth, the finer the better. Then just before the early rains can reasonably be expected sow the seed evenly and harrow lightly. I am of opinion that 1cwt. each of lime and superphosphate per acre, drilled in previous to sowing, would be beneficial. The hoes or discs must be taken off or the seed will be buried too deeply to germinate. A good plan is to substitute a board for the seed to strike to ensure even sowing for any kind of grass seed that a drill will handle, but if preferred the Rangoon knapsack seed sower is a very handy contrivance, the cost of which is about £1 1s. Even broadcasting by hand, if the seed is mixed with sand, will answer the purpose equally well. In any case the seed must not be covered too deeply. A good plan to cover it is to use a chain with a spreader like the harrows, or rolling will also answer. As lucerne is so well known very little need be said regarding that plant as to its qualities, habits, &c. It will thrive on any loose friable soil, the richer the soil and the hotter the climate the better it grows. But to get the best out of lucerne it must have an abundance of water. If the water can be reached by the roots there is no need to irrigate after once the roots have gone down to it, but where a greater depth is required it is necessary to irrigate from the top, either by flooding or with sprinklers. In large areas flooding is the best, as more can be irrigated than with sprinklers; though in small patches, say up to two acres, sprinklers can be used to advantage. The same method of cultivation as laid down for clovers also applies to lucerne, with the addition of grading the land, which is necessary to ensure even irrigation. If the ground is not too uneven a good plan is to make a triangle to suit the conditions of the soil and number of horses available to drag it. Three horses will work one about 12ft. wide made of jarrah or gum, about 6in. by 5in., and the implement is simply dragged over the ploughed land, when the ridges, hills, etc., will be dragged off and left in the hollow places. About 12lbs. or 13lbs. of seed is required per acre. It can be sown either in spring or in autumn, but in autumn it is a good plan to sow it with a cover crop to protect the young plants from frost. During our residence in this district I have tried over 20 different kinds of grasses, some with good but mostly with poor results, Paspalum being foremost as regards results, though I cannot say I am over keen on it. Stock do not relish it; in fact with us they had to be forced before they would take to it at all. However, as a standby it answered really well. During the recent hot summer we had it about 2ft. high and quite green, without irrigation. Unlike most grasses it will stand extreme cold as well as heat. The trouble we have experienced with this plant is in the germination, as it requires three weeks warm moist weather for it to germinate. I find that spring is the best time to sow it, although experts from New South Wales, which is the adopted home of the Paspalum, say autumn is the proper time. We have had no success with it sown in autumn. About 10lbs. of seed is required per acre. Where it was sown as a mixture, cattle kept it eaten down, but where it was sown by itself they had to be starved to it. Among other kinds tried was Yorkshire fog, which did better than most. Some authorities say that this is not fattening, but only keeps stock alive. For the accuracy of that statement I cannot vouch, but I have seen it used in conjunction with rye grass very extensively in the Millicent district, which is similar to our own. I have also tried rye grass, but with poor results, but as everyone knows it is one of the best for a cool district like this. I have seen it used extensively both in Mount Gambier and Millicent districts with splendid results. Where it is grown on loose soils it is not advisable to stock it with cattle, as they pull it up roots and all, but sheep and horses do no harm, as they bite it off. The horse paddock at Mount Graham Station was as good as ever it was 20 years after sowing. Cocksfoot is another good grass, though I have had no experience with it personally, but have seen it used as a mixture with rye grass and Yorkshire fog, the mixture used being 20lbs. of rye gras sand 5lbs. each of fog and cocksfoot. One more fodder that I have found good is Melilotus, but this is hardly suitable for dairy cows, as it has a tendency to taint the milk. Where the soil is loose it is a good plan to sow it after a burn as early after January as possible, as the seed has a waxy case which requires to be melted to ensure germination. It is an annual, but if allowed to run to seed it will come up thicker the second year than the first. It should be burned off after shedding the seed. This plant has a tendency to enrich the soil and will eventually kill out undergrowth. King's Island, the first place in Australia where Melilotus was grown, is now noted for it, though at one time it was a barren sandy patch in the ocean between the mainland and Tasmania. Melilotus could be grown to advantage in this district in scrubby land, especially the sandy parts. All that is necessary is to cut down the scrub, burn it when dry, and sow the seed at the rate of about 10lbs. to 12lbs. per acre. I have tried rib grass; it grows well, but cattle do not relish it, and I have not tried sheep on it. If sown it should be as a mixture. I have also tried Rhodes grass, sheep's burnet, crimson and Bokhara clover, and several others with little or no results regarding germination, so cannot say anything about them. Those mentioned above are what I know to be good, if properly cultivated; but proper cultivation is just as necessary for introduced grasses as for wheat or hay. In this district, with its assured rainfall and mild summer, land that is now practically useless could be made to carry up to two, and in some cases more, sheep per acre. Some may think that the quantity of seed advocated is excessive, but that is the quantity that I have found most suitable, and when one comes to consider that grass has a tendency to ripen very unevenly, it will be found that a few pounds more per acre are better than a few less. It will also pay to manure grasses, especially permanent kinds, both at the time of sowing and every autumn. When farmers realise what grasses mean to them, both they and the district will greatly benefit; but while natural grasses only are depended on the farmer and district will make little progress. My advice to the farmer and grazier is to try a patch every year until the whole holding is sown down, but bear in mind that 'what's worth doing is worth doing well.'" Mr. Stephenson mentioned that some Paspalum seed, which he had soaked for 24 hours, germinated 11 days after sowing, whilst unsoaked seed did not germinate until 20 days had elapsed. The Chairman (Mr. G. Hunt) said stock would soon eat out prairie grass. Ribbed grass made good sheep food. Members were agreed as to the value of cow grass.

NARRUNG (Average annual rainfall, 17in. to 18in.).

May 9th.—Present: 11 members and 10 visitors.

Afforestation.—A paper was read by Mr. G. G. Hackett. He said—"To encourage a system of tree-planting (which has become an absolute necessity, owing to the immense demand for timber), the Government has established nurseries for the distribution of young trees, and large areas are reserved and planted to increase the forest lands. The manufacture of paper alone requires some hundred thousand of acres or more of timber every year, and when one considers the thousand and one uses of timber one can readily understand the possibility of its becoming exhausted. The purpose of this paper is to stimulate discussion on the subject and its great advantages, and also to urge the individual, as far as possible, to supplement the national examples. The tree inhales through its leaves carbonic acid gas, and purifies the surrounding atmosphere. The writer has for many years used a shady tree for hanging meat under, and this has proved an unqualified success. For this purpose alone a tree or two in the vicinity of a homestead is invaluable. The deodorising power of trees is akin to that of the ocean, and residence in the forests at the proper times and season is as invigorating as a sojourn by the seaside. Trees add fertility to the soil, the natural decay adds vegetable mould, which is essential to the growth of plant life. The general appearance of this country prior to its early occupation led one to assume that trees were due to a more fertile soil, whereas, in fact, the fertility of the soil is the result of the growth of trees. The writer, after many years of observation, concludes that the evolution of vegetation in this locality was first heath and mallee, followed by trees, then grass and herbage. I am referring more particularly to the higher and inferior lands. I could point out many a little fertile oasis of from five to 20 acres, where I have noted the development as stated in the scrub country, which a generation since was heath and mallee. Mr. W. Mincham, in a paper read before the Meningie Agricultural Bureau, dwelt on the value of sheaoak (which is the chief timber of the district) as a fodder in bad seasons. He could have mentioned that its value as a fertiliser is even greater, the timber containing 6 per cent. or 7 per cent. of potash, which is one of the essentials for the growth of plant life. Trees have an important bearing on climatic conditions. Though one does not claim that trees produce rain, one has every reason to believe they have a strong influence in its conservation. The shaded temperature mellows the sun's powerful rays and materially checks evaporation. Trees also are a necessity for bird protection. It has been said that if all birds disappeared, in the space of a generation human ingenuity could not cope with the insect pest, and famine would overspread the land. There is also the utility and value of trees. Plots planted, in the course of 10 or

12 years, produce timber for all requirements on the farm, and I estimate its value at from £25 to £50 per acre at 10 years' growth. The value of shade for stock in the summer and shelter in the winter cannot be estimated, and when the timber is used up the soil has added fertility and is more fit for cultivation. Then again, how beautifying are the effects of trees in all surroundings, but more especially in rural localities. How pleasing to the eye are clumps of trees dotted here and there among the homesteads, and to the children born in such surroundings they become friends, and pleasant memories that last through life. There is an Arab saying, that he who digs a well and plants a tree leaves after him an imperishable record, for the wayfarer quenching his thirst at the well and availing himself of the shade of the tree will gratefully call blessings on the name of the benefactor; and as with the individual. so with the nation and community, posterity in due time will honor those who before them wisely and thoughtfully provide for those following, and leave an example that should endure as long as the world exists."

URAIDLA AND SUMMERTOWN (Average annual rainfall, 44·35in.).

May 5th.—Present: 11 members.

Onion-Growing.—Mr. G. Collett read the following paper:—"In the first place I would recommend growing both early soft and late keeping varieties, as the early sort will usually yield a better crop and can be marketed right off the land, and the keeping sort may be stored till later in the season. The best time for planting the seed in this district is about the middle of March. If left later the winter generally sets in before the plants get a good start, and the wet and cold weather checks their growth. I prefer having the plants grown in a warmer district, and if this is done the middle of April is the best time for sowing the seed. It should be put in drills, say, 6in. apart, as the plants are then much more easily cleaned than if broadcast. If care is given good plants should be assured. Give early attention to the cultivation and preparation of the land. I recommend growing a crop of potatoes with a heavy dressing of stable manure the year previous, as this assures the land being in good heart, and there will not be as many weeds to contend with as would be the case if the stable manure were put in with the onion crop. The land should be kept as clean as possible through the winter, and for this purpose I favor the scarifier after having ploughed once. When the time comes for planting I would give the ground a good deep ploughing, as this encourages the roots downwards and so helps them through the dry weather. Having ploughed the ground, before harrowing I would spread the artificial manure I intended for the crop, then harrow well and rake and drill ready for the plants. Having grown the plants and prepared the land the next requirement is the transplanting, which should be done in September if possible, because if we have a good spring the plants are a good size before the hot weather sets in. I would use a 10in. drill and plant soft onions 4in., and keeping varieties 3in. apart. As far as irrigating is concerned, I think that onions should have a good soaking once a week, but of course this greatly depends on the nature of the land. Keep the crop as free from weeds as possible, as every weed robs the crop of a certain amount of moisture. In saving onions for seed purposes, I would save the early sort for cropping qualities and appearance, and the late sorts for cropping and keeping qualities. It is well to put by twice as many as are required so that a second selection can be made." Mr. Hart advised gardeners to grow their own plants and transplant them as required. When early varieties were grown another good crop of vegetables could be secured from the land.

Waste Produce in the Garden.—At the previous meeting a paper was read by Mr. H. F. Johnston. He advised orchardists to run a few sheep in their holdings. These would destroy such growth as blackberries suckers, and sorrel, as well as consume windfall and codlin moth infested fruit, thus keeping the fruit pests in check. These animals could also run on the garden after such summer crops as potatoes and cabbages had been taken out. An iron post and wire netting fence could easily be erected to form an enclosure. Sheep, he thought, would be much more satisfactory in this connection than pigs, which were generally kept. They should not be given access to young trees. but to the older trees they would do more good than harm by eating the lower limbs, In some of the larger apple-growing districts sheep were run in the orchards for nine months of the year, being taken out in the winter when the land was ploughed in May. They ate down the grass in spring, and the cultivator could then be used with advantage in the early summer. In this district the spring food could be eaten by the sheep, and the land then gone over with a cultivator or duckfoot harrow. Fencing, which would cost about £16 per mile, could be of netting, or four barbed wires 6in. apart would be cheaper, although this has a tendency to tear out the wool, and was dangerous to other stock. Mr. Stacey did not think it wise to run sheep in an orchard—he preferred cultivating the land.

WOODSIDE (Average annual rainfall, 31·95in.).

May 6th.—Present: nine members and one visitor.

Compulsory Spraying of Fruit Trees.—Mr. R. R. Keddie read a paper as follows:—"I do not consider the present system of inspection a success, and with the most effective system of inspection for compulsory spraying, I do not think that the codlin moth will ever be eradicated. It is contended by some that by regular and frequent spraying now, in a few years only one spraying will be required. Allowing such to be the case, why make it compulsory? My experience this season with one apple and one pear tree which were only sprayed once, showed that they were as free from moth as those which had been sprayed three times. The fruit grower who sprays his trees will have clean fruit of good value, while the grower who neglects the spraying will have fruit that will be of little or no value. In cases that have come under my notice lately, the moth has received encouragement rather than otherwise—bandages being put round the trees and not removed once for the year. One of the effects of complying with the regulations under the Act in regard to cottage or small gardens being owned or occupied by working men, or those of small means, is, that rather than go to the expense of spraying, they are in many cases destroying the trees, which I consider a most undesirable action, as in a great many instances they are unable to buy fruit. It is admitted that spraying if properly done is effective, but why make it compulsory? I consider the most effective way to deal with the matter is to prohibit the distribution of moth-infested fruit. An inspector could deal with the fruit at all markets and places of distribution to the advantage of the seller and buyer." The majority of members were opposed to Mr. Keddie's views, but were unanimous in the opinion that the present state of compulsory spraying was the most effective way of eradicating the moth. [This paper was referred to the Chief Inspector of Fruit (Mr. Geo. Quinn), who comments as follows:—"The grounds upon which the compulsory spraying of small or large gardens is based, is that utter neglect of adjoining apple trees will make the owner who is willing to spray his orchard spend more in spraying to keep his fruit reasonably free from codlin moth. The cost of a small spraying outfit suitable for small gardens is about 30s., and the materials cost a mere fraction each year. Scores of small garden owners do spray their few trees, and these should be protected against their neighbors who are not disposed to do so."—Ed.]

FOREST RANGE, May 7th.—**Storing Wet Apples.**—In a discussion on this subject Mr. A. Green said apples would not deteriorate if stored when wet. Mr. J. Vickers stored scabby apples, which after a time became covered with mildew. Apples stored wet, he thought, always lost their glossy appearance. Mr. F. Green preferred storing dry apples, but dew did no harm. Apples wet with rain generated too much heat.

Onion-Planting.—Mr. E. Green favored planting onion seed in drills about 4in. wide. Mr. Vickers had obtained the best crops by planting in drills about 8in. wide. The wider the drill the more the plants sheltered one another. Mr. F. Green patted the ground down before sowing the seed, then covering it with stable manure to prevent caking. Mr. McLaren would not use stable manure for onions because of the weeds.

Pruning Apples.—Mr. Vickers did not favor early pruning, as this might cause the bark to split, offering a good opportunity for woolly aphis to gain a hold. Mr. Rowly thought the early pruned limb was more apt to die back from the cut.

Sulphate of Ammonia.—Mr. E. Green thought August the best time to apply sulphate of ammonia. He had used it in November and the results were not so good. An application of 3lbs. or 4lbs. was sufficient, and it should only be used occasionally. Mr. Vickers thought it had a more lasting effect if applied in August. In his opinion the fruit was more likely to contract bitter pit if the tree were dressed with this fertiliser. Both the tree and the fruit appeared greener.

LONGWOOD, May 9th.—The meeting was held at the homestead of Mr. J. Roebuck. The garden, which was irrigated by means of gravitation, was planted to turnips, swedes, radishes, rhubarb, and celery, the latter being planted about August in rows 18in. x 8in. A 6in. galvanized pipe, about 16in. long, was placed over each plant. The onion seed bed was prepared by growing and ploughing under a crop of oats. Twenty-four varieties of apples and seven varieties of pears were tabled.

MOUNT PLEASANT, May 9th.—Mr. Thompson contributed a short paper with regard to the introduction of lads as farm apprentices.

PORT ELLIOT.—Mr. P. R. Cudmore gave a very interesting account of a trip through Tasmania, describing many features connected with the fruit and hop growing industries, etc.

SOUTH-EAST DISTRICT.

KYBYBOLITE (Average annual rainfall, 22in.).

May 7th.—Present: eight members.

Fertility of Wheat Lands.—The Hon.-Secretary (Mr. E. C. H. Schinckel) read a paper on "The Fertility of Wheat Lands,' reprinted from the Victorian *Agricultural Journal*. "Fallowing is an excellent means of storing up soil moisture and cleaning the land, and on this account it pays for doing. But in the long run the wheat, fallow, wheat system can only be reviewed as a temporary expedient. Where it is well done the soil is seriously depleted of organic matter by fallowing. In California the conditions somewhat closely resemble those of our northern areas, but cultivation is of older date, and the experience of California, therefore, is for us fully significant. The subject is dealt with in an exhaustive bulletin (211) issued by the State University—'Continued grain culture under shallow preparation over a long period has seriously affected the naturally low humus supply of the grain lands of California. This condition has been rendered worse by the burning of the straw, and biennial culture necessitated by a limited rainfall. Humus in ample quantity means success · its lack means disaster, and this is particularly true in dry land farming.' The bulletin quotes a number of experiments, showing the excellent effects of ploughing in green manures as a preparation for wheat, and states that the wheat yield of California can be doubled by following this system, coupled with deeper cultivation.. As ploughing-in crops, rye is recommended as a start, to be followed later by an admixture of rye and peas, or vetches, when a foundation has been laid. Rye has been found the surest. Whatever crop is used it should be seeded as soon as it is possible to shallow-plough or disc the land in autumn, and the crop should be turned under in early spring, before the land is too dry for deep ploughing, and while it is still moist enough to start humification, or decay of the material ploughed in.'"

MOUNT GAMBIER (Average annual rainfall, 32in.).

May 9th.—Present: 18 members.

Lincoln Sheep and Wool.—Mr. W. J. Sutton read a paper from *The Pastoralists' Review*. In discussing the subject, Mr. A. J. Wedd said the Lincoln-Merino cross was the best for wool for this district. Mr. G. H. Kilsby also advised this cross. Mr. E. F. Crouch observed that in New Zealand the broad-locked Lincoln was a better constitutioned sheep than the narrow-locked. About three years ago he visited a station where they put a number of Merino ewes with Romney Marsh rams, and some with Lincoln rams. All the lambs ran in one paddock, and had equal opportunity. The Lincoln cross gave between half to three-quarters more wool than the Romney cross, but the latter brought ½d. per pound more for the wool, so the results were about equal. What they would do on richer land like that around Mount Gambier would make all the difference in the world. To grow Lincolns successfully they had to put a lot down their throats. Everyone had to run sheep to suit his country.

Miscellaneous Matters.—The President (Mr. J. Wedd) had purchased a couple of tools lately that, he thought, might be of use to members who were troubled with rabbits. They were narrow spades, such as were used for laying tiles for drains. They would be useful in putting down netting to keep rabbits from crawling through, as it would obviate the worker shifting an unnecessary amount of earth. Another spade had a very long handle and a sort of goose-neck on it, which enabled a man to dig out a deep narrow trench. It would be very good for digging out rabbit burrows. Mr. Holloway had found that rape dressed with superphosphate, sowed broadcast, became immune to aphis. Mr. Crouch read an extract showing the value of lime and super. applied to the land with an interval of several days between.

NARACOORTE (Average annual rainfall, 22·60in.).

May 9th.—Present: seven members.

Rivalry Among Agriculturists.—An interesting paper under this heading was read by Mr. S. H. Schinckel. Healthy competition among sheepbreeders, he said, was largely responsible for the large-framed Merino sheep of South Australia. The same applied to improvements in horses, cattle, poultry, &c. Every farmer should strive to accomplish more than his neighbor in the way of quality of his crops, cultivation, &c. For the sake of economy most stables and sheds were built of rough material, and rightly rightly so, too; but only too often the builders paid little attention to neatness and convenience. Stable manure was frequently neglected. This should be regularly carted to a site selected, and not left about the stables and yards. Farm machinery should be kept under cover when not being used, the wood work being kept painted. No stock should be allowed to camp under the machinery sheds. Harness should also receive due attention, and fences be kept in repair. Rabbits and suchlike pests should be kept in check. A small flower garden was much more attractive in the front of a house than star thistles, &c. A healthy rivalry amongst farmers to excel in matters of this nature would work for the general good of the farming community. Mr. W. H. Smith mentioned cases where he had noticed improvements on farms which he had visited, and had adopted them on his own holding. It was decided to fully discuss the paper at the next meeting.

KEITH, May 9th.—Members thought fallow should be worked well to destroy weeds and secure a fine seed bed. On wheat land Scotch thistles should be destroyed, but they would soon die out if the land were not cultivated. Mr. Makin advised cutting shoots at the end of March or April, putting them on the stumps, and then burning. Seed should not be drilled too deeply.

* * *

Wheat Stacks Port Wakefield.

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The results of experiments in connection with methods of agriculture, etc., stock and poultry diseases, insect and fungoid pests in South Australia and other lands are recorded, as well as the results of work at Roseworthy Agricultural College.

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T. PASCOE,

MINISTER OF AGRICULTURE.

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All communications to be addressed:

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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

The Social Phase of Work of Agricultural Bureau.

Speaking at a highly successful gathering held by the Blackwood Branch of the Agricultural Bureau on Monday evening, June 15th, the Minister of Agriculture (Hon. T. Pascoe, M.L.C.) expressed his gratification that the Branches of the Bureau were fostering the social phase of their work to a greater extent than had been the case. "It was a good thing," he continued, "to get wives and daughters interested in the work of the institution which had not only materially assisted farmers to overcome their difficulties, but had taught them to express their ideas in an intelligent and forceful manner, so much so that the South Australian farmer was often quite capable of holding his own in discussion with trained scientific men, and, therefore, the better able to reap the full benefit from lectures and debates generally." A report of the proceedings is included in the section of this *Journal* devoted to meetings of the Branches of the Bureau.

Farmers' Conferences.

The annual conferences of the Eyre Peninsula and the Pinnaroo District Branches will be held in August. The former will take place at Cleve on Tuesday, August 4th, with sessions in the morning, afternoon, and evening; and the latter at Lameroo on Friday and Saturday of the same week. The first session at Lameroo will be at 3·15 p.m. on August 7th, and followed by an evening session at 7·30; there will also be a morning session on the 8th, prior to the departure of the train to Adelaide. Members of the Advisory Board and officers of the Department of Agriculture will be present at these conferences, and papers of a practical nature will be submitted and discussed by representatives of the Branches in the districts. The usual concession of excursion fares on the railways will be available to *bona fide* members of the Agricultural Bureau upon application to the Secretary Advisory Board of Agriculture, Adelaide.

Synthetic Milk.

At a recent meeting of the Central and Associated Chambers of Agriculture, held in London, it was resolved that the Government should be urged to take legislative action to prevent synthetic milk, manufactured from soya beans and other materials, being sold as milk or under any adaptation of that name.

Sheep in the United States.

An authority in the *Pacific Rural Press* reports that there is a serious decrease in the number of sheep being raised in the United States. The decrease in the principal sheep States is given as follows :—Montana, about 40 per cent. ; Idaho, about 10 per cent. ; Utah, about 15 per cent. ; and Oregon, about 10 per cent. It is estimated that there will be a decrease of about 25,000,000lbs. in the 1914 clip.

Size in Cattle.

It is much the same in our modern markets with cattle as with sheep, in both of which coarseness is a thing to be avoided, and breeders must recognise the consumers' demands for small joints and breed accordingly. The butcher is a keen admirer of high breeding in cattle. He has experienced all sorts and sizes, and is sharp to recognise what pedigree brings and pays by results. The market, says the *Agricultural Gazette*, is the final court of judgment for all the bovine race, and that is the place to convince any doubter of the value of pure breeding. In one respect there is a great difference between sheep and cattle as regards the standard of quality. With regard to dairy cows, it is true that town dairymen and many dairy farmers still connect great size with great value, but it is extremely doubtful if they are wise in so doing. The larger the frame the more food is required, while the yield of milk is not necessarily more abundant.

Sunflower Culture.

Hitherto sufficient attention has not been paid to the commercial advantages of the sunflower. It is extensively grown in Russia, the United States, and other parts of the globe, but not so much in this country. This mammoth flower flourishes in a damp situation in a moderately strong soil. The seed is usually sown from 3ft. to 3½ft. apart, and from 2in. to 3in. deep. The young plants are generally thinned out so as to be from 12in. to 18in. apart. The quantity of seed required per acre is about 7lbs. The heads are gathered before they are quite ripe. In America quantities of seed are cultivated for poultry purposes. The chickens like the seed, and fatten quickly upon it, owing to the rich oil it contains. Small holders who have odd corners of land unsuitable for ordinary cultivation will be well advised in experimenting in sunflower cultivation. The stalks may be burnt, and the ashes returned to the soil as a fertiliser. Besides its value for poultry, sunflower seed is useful for feeding cattle and horses. For cattle a cake made of the seed is on the market. This is used for cattle in the same way as linseed cake ; 4lbs. of good sunflower cake is reckoned as equalling 3lbs. of linseed cake. The best cake contains from 10 per cent. to 11 per cent. of oil. Sheep also thrive on the cake, this being substituted for other kinds of seed cake. For pigs it is best used in conjunction with beans, peas, and barley meal. It is estimated that an ordinary field crop yields from 50bush. to 60bush. of seed to the acre. The usual price in the United Kingdom of sunflower seed for feeding purposes is about 15s. per cwt., as against 13s. 8d. per cwt. for Indian linseed. The price for nutted sunflower cake is generally from £6 5s. to £6 15s. per ton.—*Horticultural Review.*

Length of German Working Days.

In a recent German agricultural paper the details of the working day throughout the year are given for an estate in Posen. During January and February the day's work begins at 7·30 in the morning, during March at 6, while from April to September work starts at 5·30. In October the working day begins at 6, in November at 7, and in December at 7·30. During the months from April to September there is a half-hour rest period, with lunch served in the field, from 8 to 8·30 in the morning. There is an hour for the noonday meal throughout the year, from 12 to 1. In the afternoon there is a half-hour rest period with lunch, from 4 to 4·30, during the summer months, from April to August. The end of the day's work comes at 4 in December and January, 4·30 in February, 5·30 in March, 7 in April, 7·30 in May, 8·30 in June and July, 8 in August, 7 in September, 6·30 in October, and at 5 in November. The hours of work per day, inclusive of rest periods, for the various months are as follows:—January, 7½; February, 8; March, 10½; April, 11½; May, 12; June and July, 13; August, 12½; September, 12; October, 10½; November, 9; and December, 7½. The average length of the working day for the whole year is 10 hours and 35 minutes.—*Agricultural Gazette.*

Pure Milk Supply.

The Pure Food and Health Society of Great Britain have issued a proposed set of rules relating to the sale of milk right from its source, various sections being concerned with the conditions under which it is produced and stored at the farm, with its treatment in the town dairies, and with its supply to customers. Farmers and dairymen who agree to these rules will be permitted to use the society's pure milk seal, though this, says the *Mark Lane Express*, is not to be taken as a guarantee of purity, but merely as an indication that the precautions indicated have been carried out. The producer who desires to sell milk under this seal has to agree to periodical examination of his cows by a veterinary surgeon and by tuberculin tests. All milk is to be strained at the farm, and provision is to be made for cooling it immediately after milking. Detailed rules deal with the drainage and general cleanliness of cow sheds, the isolation of sick and newly-bought animals, the water supply, and the manner of milking. The milkers are to be under periodical medical inspection, and have to give an undertaking to report any form of sickness at their houses. Any addition to or abstraction from milk, whether coloring or any substance or liquid, is to be absolutely prohibited, and various milkings are not to be mixed. In town dairies the society requires a certificate as to proper drainage, and insists upon the most extreme cleanliness in every part of the building. Milk is to be sold only in glass bottles, which must be sealed before leaving the dairy, and not merely plugged with pulp covers. All pasteurised, sterilised, or separated milk must be so labelled, and dairies treating milk by those processes must be required to subscribe to additional conditions.

Selling Cattle by Live Weight.

In view of the discussions which have at various times taken place in regard to the inauguration in South Australia of the practice of selling cattle by live weight, it is interesting to note that when cattle are forwarded to the San Francisco market, where this practice is in vogue, it is the custom for butchers to hold them for 24 hours without feed or water before they are weighed. "If this were not done," says the *Pacific Rura Press*, "the sellers would very often fill the stock up with water and feed during the last 24 hours, with a resultant loss to the buyer when the cattle were butchered."

Imports and Exports of Fruits, Plants, Etc.

During the month of June, 1914, 1,111bush. of fresh fruits, 11,106bush. of bananas, 7,037 bags of potatoes, and 160pkgs. of seeds, plants, bulbs, and trees were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these, 660bush. of bananas, 35pkgs. of plants, and 36pkgs. of trees, were fumigated, and 146bush. of bananas were destroyed (over-ripe). Under the Federal Commerce Act, 2,445bush. of fresh fruits, 2,624pkgs. of dried fruits, 12pkgs. of honey, 16pkgs. of seeds, and 18pkgs. of plants were exported to oversea markets during the same period. These were distributed as follows:—For London, 1,213pkgs. of dried fruits, 539bush. of oranges, and 1,040bush. of apples; for South Africa, 16pkgs. seeds, 296pkgs. of dried fruits, 12pkgs. honey, 3pkgs. of plants, and 9bush. of apples; for India, 280bush. of apples; for Canada, 400pkgs. of dried fruits; for Vancouver, 50pkgs. of dried fruits; for New Zealand, 15pkgs. plants, 665pkgs. of dried fruits, 480bush. of lemons, and 97bush. of oranges. Under the Federal Quarantine Act, 11,409pkgs. of plants, seeds, bulbs, nuts, &c., were examined and admitted from oversea markets.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

STOCK INQUIRIES.

(Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.)

"E. N. H.," Eurelia, had a five-year-old mare which became stiff, and after three days got down, could not rise, and had to be shot. The mare was stable-fed, and did not appear to be in pain. At date of writing a gelding was developing similar symptoms.

Reply.—The symptoms are of toxæmic paralysis. It would be of interest to know the color of the patients and to see samples of the feed. Treatment.—Entirely change feed, giving bran and oats with a little linseed or olive oil in each feed, say a tablespoonful. Purge with a pint and a half of raw linseed oil or half a pint of castor oil. Give twice daily a tablespoon of Fowler's solution of arsenic and a teaspoonful of sulphate of quinine; if the animal is eating it will take them in the food; if not, mix with a little molasses and put into the mouth. It would be well in similar cases to communicate with the Chief Inspector of Stock, who would probably send a veterinary surgeon.

"P. H. R.," Balaklava, has a black mare who slipped a foal and had some difficulty with the afterbirth. Three weeks afterwards she became stiff, could not rise, had to be slung. She received Fowler's solution of arsenic and sulphate of quinine. She has a difficulty in urinating.

Reply.—It is difficult to determine from the symptoms whether this is a case of laminitis or of toxæmic paralysis, but probably the latter. It would be well to stimulate her hindquarters with a blister or liniment and continue the treatment; but try an entire change of food and purge with half a pint of castor oil.

"J. A. L." asks cause of death of horse which one day after working was noticed to be breathing heavily, the breath being very foul. The animal became worse and died in three days.

Reply.—The horse had inflammation of the lungs before being noticed; he should not have been worked when ill. Should others go the same way notify the Chief Inspector of Stock at once, and a veterinary surgeon will attend. Do not work; steam with only one teaspoonful of eucalyptus or turps. Give iodide of arsenic 4 grains, sugar of milk 10 grains, twice a day on tongue.

A member of the Coorabie Agricultural Bureau asks—What is a fair feeding ration for a working horse?

Reply.—The answer to this must be that it depends on individuals and circumstances; but certainly horses can be overfed and lose flesh on that account. The bulletins of the Roseworthy chaff-feeding experiments will give valuable information; also a little book, "The Economics of Feeding Horses," by Prof. Woodruff, now of Melbourne. Theoretically the nitrogenous ratio should be about 1-6. A horse weighing 1,000lbs. requires—For body maintenance, 6·5lbs. digestible starch with 0·65 protein; for work, 8·5lbs. digestible starch with 0·85 protein; total, 15lbs. digestible starch with 1·5 protein. Then age, weight, conditions of work, weather, balance of nutrient substances, and other conditions have to be calculated. Speaking generally, the feed of South Australian farm horses is deficient in fat and protein, and the energy expended in getting the nutrition out of it is greater than the nutriment obtained; hence horses fall away while getting large quantities. A mixed ration always gives better results than a plain one. Probably, for practical purposes, 40lbs. chaff, 6lbs. oats, 1lb. peas, 5lbs. hay (at night) would be quite sufficient for a big horse. On Sundays 4lbs. bran would take the place of oats and peas.

"H. G.," Waikerie, asks treatment for horse which had a swollen sore throat, with heavy breathing; when drinking water ran back through nose.

Reply.—Probably a chill and bronchitis. Steam with a teaspoonful of eucalyptus and give a teaspoonful of saltpetre twice a day in bran for a few days. A little Stockholm tar on teeth will also help.

Members of Goode Agricultural Bureau ask information concerning (1) mare dropping hips after foaling; (2) a cow, subject to fits—she bellows, rushes about and falls down, but in a little while fit passes off; (3) a horse which passes dung streaked with black clotted blood and of very bad smell.

Reply.—(1) The cause is failure of the bones of the pelvis to come together properly after birth. Prevention, keep mares at work; treatment, get in foal. Probably the bones will set right after the foal is dropped. (2) Probably tuberculosis of the brain, or worm cysts on the brain; possibly yacca has something to do with it. Feed and slaughter. If desired give nux vomica 1drm., sulphate of iron 1drm. in food twice daily for a fortnight. This will help if yacca is the cause. (3) Keep on with nux vomica, but also give arsenicum, 10 drops, three times a day. If these do not effect a cure, give a teaspoonful of sulphate of quinine once daily as well, in food. The trouble arises from bloodworms, the inner coat of the bowel having been destroyed by them.

"R. B.," Koppio, asks treatment for horse suffering from injury on inside near hind leg, 4in. above hock, possibly due to kick. The horse is in great pain, but there is very little swelling or discharge.

Reply.—A kick in this position often causes a greenstick fracture of the tibia, which gives no more definite symptoms than those described, but sometimes weeks after the bone breaks in two. Treatment—A good dab of Stockholm tar and rest in a small paddock.

"J. P.," Tarcowie, seeks advice as to treatment for mare whose udder swells when foal is being weaned.

Reply.—Wean gradually. When foal is off, rub udder with a warm solution of alum, a teaspoonful to a pint of water, and follow by hot lard or soapsuds. Give a little cooling medicine, such as an ounce of Epsom salts three times a day in feed or drinking water for a few days. Feed on long hay only, and not much of it.

"McG.," Whyte-Yarcowie, asks information concerning gelding which became ill 6·30 a.m. and died 12 hours later. The stomach was found ruptured and parts very frail. Numbers of small white worms like fine sewing cotton were found.

Reply.—The part of the stomach received is affected with an abscess caused by the fine worms described (*Habronema equi*), which find their way into the stomach from stable and house flies, with the result named. There are no definite symptoms, but sometimes the horse hiccoughs and draws his chin in to his breast. In such case a heaped teaspoonful of baking soda daily in the food will upset the worms when at work forming the abscess.

"J. R. C.," Longwood, asks whether cows would be likely to be injured if allowed to eat wattle leaves.

The Dairy Expert (Mr. P. H. Suter) replies—Wattle leaves would upset the digestive system, thus reducing the milk yield, and the milk secreted would have a taint which would also be communicated to the butter.

"H. S.," Macclesfield, has a gelding 9 years, which scours badly and, therefore, is in poor condition. He has given the animal aloes and nux vomica, as recommended, but without any improvement.

Reply—Trouble probably arises from systemic weakness of the bowels or a cancer growth in them. Never water before work and keep supply short. Give twice daily, in food, a powder containing chalk, 2 drams; catechu, 1 dram; cinnamon, 1 dram.

"H. F. J. H." had cow which calved and was cleaned properly; 48 hours later she became paralysed and died. He asks cause, as several other cows in district have died from apparently same trouble.

Reply—Probably milk fever. Treatment—Fill udder with air; keep cow on breast and warm; do not drench.

"S. B.," Murat Bay, had horse, 15 years, which became sanded; was successfully treated with honey and put in another paddock. Later, horse appeared filled with wind and suffered very acute pain and died. *Post mortem* showed that bowel had burst and some bots were found.

Reply—The bowels burst on account of the distension by gas, a condition which frequently follows change of feed in old horses. The bots were not responsible, neither was the drenching, for, if so, the horse would have remained standing for two or three weeks. When a horse cannot pass wind well rub the flanks and put 4ozs. glycerine in the enema. Give as a drench one-quarter pint gin, 25 drops ess. peppermint in half-pint warm water. This condition is usually termed stoppage of the water, which it is not. Horses hold their water because of the pain in their bowels.

"W. H. G." asks advice concerning 6-year-old mare. Her coat is sleek but she is low in condition, a very slow feeder, and slobbers and wets the nosebag through. Teeth have been looked at and seem all right.

Reply—The mare has abscesses in her stomach caused by minute worms. Give her a heaped teaspoonful of baking soda twice a day in her food for a month, and once a day in her food give her two tablespoons of Fowler's solution of arsenic for a fortnight.

"J. L.," asks treatment for cows which fail about a fortnight after calving, lose appetite, and yield milk which smells badly.

Reply—Probably the cows do not clean properly, and it would be well to give a few hours after calving a drench made of Epsom salts, 1lb.; sulphur, 1oz.; ginger, 1oz., dissolved in a quart of warm beer.

"A. E. C.," Crystal Brook, requires advice concerning cow, 10½ years, which used to give 14lbs. butter a week. Front right quarter became hard, milk fell off, rubbing and vaseline did not improve matters; two hindquarters have gone same way.

Reply—Inflammation of udder, probably arising from the attack of the germ which produces the contagious form; but in the case of a valuable cow it would be well to have a veterinary surgeon to see her, as there is a possibility of tuberculosis or actinomycosis. In the meantime, dissolve a teaspoonful of boracic acid in a pint of warm water and inject a quarter of the quantity into each teat once a day for a few days after milking, rub the udder well with hot soapsuds also, and give twice a day, in a little molasses on the tongue, 10 drops of tr. phytolacca for a fortnight or so. Treat it as if contagious and handle her last, washing the hands after doing so. Do not milk on to the ground. Destroy milk.

"F. R. F." seeks advice concerning young cow carrying third calf which is languid and mopes about near water all day. The brisket is swelled very much. A previous one, showing similar symptoms, had a clear jelly-like fluid in the swelling.

Reply—The symptoms are those of inflammation of the heartbag or pericarditis, which arises sometimes from a chill or foreign body in the chest such as a piece of wire ; or hydatids, which are very probably the cause in this case ; other parasites such as flukes may cause it. It would probably be most economic to shoot the cow, in which case any strange substances might be wrapped in a cloth soaked in strong brine or 4 per cent. formalin and sent to the Veterinary Lecturer for examination. If treatment is decided on, 10 drops of tr. digitalis three times a day for a fortnight might be tried.

"K.," Wepowie, asks the effect of molasses on the teeth of horses.

Reply—Molasses are not necessarily destructive to teeth, but if fed in greater quantities than 5 per cent. of the bulk of food set up acid indigestion, which eventually will react on the teeth.

Members of the Mount Remarkable Agricultural Bureau inquire treatment for sand crack on hoof of horse, which has become very painful and with offensive discharge.

Reply—Pare to bottom of crack to allow drainage ; remove all pressure at bottom by cutting away wall on each side of crack ; keep wrapped in cloth soaked in tr. arnica 1 part, glycerine 10 parts, for a few days, afterwards fill crack with wax or similar substance ; coat over with tyre solution ; and shoe so that no bearing comes on bottom of crack. Repeat treatment when necessary.

HORTICULTURE.

"E. P." asks what varieties of pears and Japanese plums should be planted on Bay of Biscay badly-drained soil, also for rotation of peach trees.

The Horticultural Instructor (Mr. Geo. Quinn) replies—I cannot recommend planting any kind of pear on very undrained soil. The Glou Morceau on quince stock may succeed, but would suggest the drainage be improved, and then any kind of pear or pear seedling stock would succeed. The favorite varieties of pears at the present time appear to be Beurre Bosc, Beurre Diel, Beurre Clairgeau, Clapp's Favorite, Doyenne du Comice, Glou Morceau, Harrington's Victoria, Josephine de Malines, Madam Cole, Packham's Triumph, Passuns de Portugal, William's Bon Chretien, Vicar of Winkfield. Of all these, though much despised, the lastnamed is probably the heaviest cropper, and carries to Europe most consistently. The above remark respecting the soil also applies to Japanese plums. Of these, Climax, Burbank, Federation, Formosa, Rubio, Wickson, and Wright's Early are probably the best; but I do not advise planting these in any number, as at present they appear to possess a value as fresh fruit only. A rotation of peaches is comprised as under:—*High's Early Canada, Ulatis, *Triumph, *Hale's Early, Ruby Red, Wiggins, *Peregrine, Louis Grognet, *Mountain Rose, *Early Crawford, *Elberta, Lovell, Red Shanghai, *Belle of Georgia, *Finlayson's Seedling, *Lady Palmerston, *Salwey, *Pullar's Clingstone, Red Italian Clingstone. A smaller selected list of these is marked *.

ANTHRACNOSE ON GRAPE VINES.

"Fruitgrower," Clare, asks for information respecting the remedies found most acceptable in Europe and elsewhere in the treatment of anthracnose on grape vines.

Mr. Quinn replies—Owing to the limited amount of local data, I have consulted the work of E. Bourcart, D.Sc., "Insecticides, Fungicides, and Weed Killers," published in 1911, for information respecting the above.

Sulphuric Acid.

On page 86, in discussing the use of sulphuric acid as a remedy, he states, "*Gleosporium ampelophagum, Sacc.*" (so-called Grape Rot). "To combat this disease the utility of the acid was found empirically. It is not, it must be understood, a question of treating this disease during the growing period, for sulphuric acid, or even the acid mixtures, would have a deplorable action on the stocks. The acid is used exclusively in winter to cauterise the spots hollowed out of the young wood, sorts of canker produced by the anthracnose containing spores which should be considered as hotbeds of infection. The remedy most generally used is a 50 per cent. green vitriol (sulphate of iron) solution; but to intensify its action it is associated with sulphuric acid in the proportion of 1 per cent. to 2 per cent. Fifty kilogrammes (110lbs.) of green vitriol are taken and 1 litre (say, 4lbs.) of sulphuric acid are poured on to it, and the whole dissolved in 100 litres (22galls.) of hot water.

"However, many vinegrowers limit themselves to sulphuric acid and regard it as sufficient to circumscribe the disease. Bouchard, Debray, Belese, and McAlpine are unanimous in eulogising the good results of this method, which, according to McAlpine, is in current use in Australia. It is certain that it kills not only the spores of this disease, but also those of oidium. It is important to operate before budding time, so as not to injure the growth. It is necessary to imbibe the stems, the runners, and all the wood, and even the eyes. The latter, owing to this treatment, blossom, it is true, some days later than non-treated vines, but this, in many cases, is an advantage. The coat may be applied with a brush or a woollen mop rag (on a handle)."

Sulphate of Iron.

Under the heading of "Green Vitriol," page 185, we find the statement respecting the treatment of the same disease. "Sulphuring and treating the vine with cupric bouillies (copper mixtures and compounds such as Bordeaux and Burgundy mixtures) have not circumscribed this disease at the same time as the oidium and mildew. Anthracnose must be treated by itself, and only winter treatment with green vitriol has proved entirely satisfactory. Schnorf was the first to advise the use of 50 per cent. solutions of green vitriol to contend against this disease, and Skawinski was the first to add to these solutions a small amount of sulphuric acid to render the solutions more corrosive. This last has given perfect results. Studied in different countries, this mixture has undergone some alterations of importance. Sorauer advises a 40 per cent. solution ; Tomé, a 35 per cent. ; Ghirardi, from 0·52 per cent for young shoots to avoid scorching by stronger doses ; Bolley advises 50 per cent. of green vitriol and 5 per cent. sulphuric acid ; Galloway, 6 per cent. of green vitriol and 5 per cent. of sulphuric acid ; Scribner, 23·6 per cent. of green vitriol, 6·6 per cent. of blue vitriol (bluestone or copper sulphate), and 1·9 per cent. of sulphuric acid ; Thomas, 20 per cent. green vitriol, 14 per cent. blue vitriol, and 12 per cent. of fat lime ; finally, Orillard, 25 per cent. of green vitriol and 10 per cent. of blue vitriol. Contrary to the opinion of Berlese, who attributes the success of these mixtures to their (free) sulphuric acid content, alone capable, in his opinion, of sterilising the cankers produced by anthracnose, green vitriol (iron sulphate) employed pure is perfectly capable of giving excellent results ; moreover, it has the advantage over 10 per cent. sulphuric acid solutions of not scorching the buds and only retarding their unfolding slightly. If the addition of blue vitriol (copper sulphate) be not injurious, and if mixtures containing this product have given excellent results in the Haute Garonne, this salt (*i.e.*, blue vitriol) is not indispensable and adds to the cost of the treatment. To-day, 50 per cent. solutions of green vitriol acidulated by sulphuric acid are in constant use in the Bordelais ; they are included in the annual treatment of vines in Medoc and in districts which suffer from anthracnose. The green vitriol solutions are made thus—50 kilogrammes, equalling 110lbs. of green vitriol (iron sulphate), are placed in a wooden or stoneware vat, then mixed with 1 litre (4lbs.) sulphuric acid of 53 B (commercial sulphate acid). Whilst stirring with a stick, 100 litres (22galls.) of hot water are run into the receiver. The precaution of first mixing the green vitriol crystals with the sulphuric acid is necessary to avoid projection (spurting) of the corrosive liquid. The solution is applied hot to prevent crystallisation on cooling. . . . . It is necessary to coat (the vines) from below, upwards, so as not to scorch the buds ; it is also preferable to unbark the stock (take off loose dry bark of the vine) before using this corrosive liquid." In bad cases, Dr. Bourcart advises "Two applications at an interval of 15 days, and the last operation should not take place within 15 days of the opening of the leaf; after coating the wood becomes black. When anthracnose is developed during plant growth it is contended against by mixtures of sulphur and green vitriol in powder form (powdered bluestone and flowers of sulphur). This treatment stops the development of the spores; but it should be renewed several times to protect the vine. It is, in fact, a preventive rather than a curative method."

It would appear from the above that the iron sulphate and sulphuric acid compound is favored as against the simple sulphuric acid solution by this writer. The exact percentage of sulphuric acid, when used alone, is not clearly indicated, but from the general context strengths varying from 1 per cent. to 10 per cent. appear to have been tried. These percentages are evidently calculated from weight. Our commercial sulphuric acids weigh about 1·83 times as heavy as water, volume for volume.

"A. Y.," Owen, has forwarded twigs of orange trees asking for the name of the disease affecting same, and also stating that his 7-year old trees were looking pale and unhealthy.

Mr. Quinn replies—The leaves and shoots are affected by the black scale (*Lecanium oleae*)), which is in the immature stage, and may be found readily as small oval-shaped, brown-colored, limpet-like creatures upon these twigs and leaves. The surfaces of the leaves and shoots are covered with 'sooty mould,' which is a fungus found growing upon the sweet liquid excrements of the scale, which have been spread over them as a film by the dew or rain or by water you have applied in hosing the trees. This fungus is not a parasite upon the plant, but, of course, obstructs the passage of light to its leaf surfaces. The remedy consists in destroying the scale insects which are the primary cause of the trouble. This may be done by spraying the trees occasionally—seeing that all parts are coated—with kerosine emulsion made by dissolving ½lb. soap in 1gall. of water by boiling, and whilst boiling hot pour into it the kerosine and churn it with a syringe or spray pump from one bucket to another into a creamy substance from which the kerosine oil does not come to the surface. This will take about half an hour's vigorous churning as described. For use, you put one part of this stock solution into about 14 parts of water—preferably warm water—and keep it stirred whilst being sprayed on to the tree. Do not use the stock solution if the kerosine separates at all freely after standing, but re-agitate the whole thing over again. In respect to the pale color of your trees, I suggest you sprinkle about 1lb. sulphate of ammonia and 1lb. sulphate of potash upon the soil around each tree, starting just under the foliage and making a circle extending 2ft. or 3ft. farther out. You may sow these together and dig them in with a fork so as to mix them with the soil. These manures will cost you about 6d. per tree to apply, and will, I think, cause them to take on a healthy green appearance as the spring time comes around.

"S. L. G.," Ardrossan, wishes to know the most suitable varieties of nectarines, peaches, and apricots for his district.

Reply—The following are recommended :—Nectarines, Dr. Chisholm, Goldmine, Stanwick; peaches, High's Early Canada, Mountain Rose, Lady Palmerston ; apricots, Newcastle Early, Oullin's Early, Moorpark. These are placed in their order of ripening.

A New South Wales correspondent, who states that he has read with interest Mr. Quinn's work on pruning and Mr. H. E. Laffer's contributions to the *Journal*, asks—(1) The name of earliest ripening grape in South Australia ; (2) the remedy for curl leaf on peaches ; (3) a description of Black Malaga vine ; and (4) best remedy for anthracnose.

Reply—(1) The earliest ripening grape grown here is Green's Early, which is never ready when grown outdoors before the first or second week in January. (2) The best remedy tried here for curl leaf in the peach and nectarine is a spray made by dissolving 1¼lbs. washing soda and 1lb. bluestone in separate vessels, each holding, say, 5galls. of water, and then mixing the contents so as to make 10galls. of spray. This is applied when the flower buds are opening in the spring ; but in wet districts it is necessary to give two dressings, one about a fortnight before the buds open, and the second as they expand. (3) The Black Malaga variety of grape vine, as grown here, has smooth, large, light-green foliage, borne on thick, brown, barked shoots, which often fail to ripen at the extremities. The bunches are large and long, and the black berries are loosely clustered in the bunch. The skin of the fruit is red before turning black, and it is a very firm, tough-skinned, oval-shaped berry of average sweetness, ripening about the latest of all the varieties grown here. It is sometimes called Malaga Muscat, but it has no muscat flavor. (4) The best remedy for anthracnose in the grape is, after burning all prunings, to take 56lbs. sulphate of iron, put it in a wooden vessel, and pour over it 2lbs. of commercial sulphuric acid ; then pour in 11galls. of boiling water and stir it into a solution. Mop this over all parts of the vine, more particularly the rods and spurs saved from last season's growth. This is very corrosive and should not be allowed to touch the skin or clothing of the person applying it.

POULTRY.

"R. B.," Wirrabara, asks treatment for fowls which lose use of legs and become very mopy ; the comb is pale, droppings thin and green and white color. About 12 have died. There is no sign of tick, and birds run at large.

The Poultry Expert (Mr. D. F. Laurie) replies—Your birds are probably suffering from the effects of intestinal worms, which have been very much in evidence this year. As the birds run about you will have some difficulty in dealing with them. However, obtain a supply of Bickford's worm paste and use as directed. You will need some bran and pollard to make a mash, and I should treat the whole flock.

SUPERPHOSPHATE.

The Maitland Agricultural Bureau inquires—(1) If superphosphate loses 140lbs. in each ton by evaporation, what percentage is required to bring the remaining manure to the standard ? (2) Seeing that it is known that superphosphate loses weight by evaporation, should not the manufacturers give a certain amount of overweight to allow for same ? (3) Does the Government analyse manures free of charge in cases of dispute ?

The Inspector of Fertilisers, Mr. G. Quinn, replies—(1) The loss due to evaporation by superphosphate is that of moisture only, so that the sample which has lost 140lbs. weight to the ton has become that much more concentrated, and if tested for phosphate of lime or phosphoric acid would simply be increased in percentage. The quality of the article has not in any way deteriorated, because the whole of the valuable constituent purchased is still there. In using superphosphate of the condition stated, 105lbs. would contain as much phosphoric acid as 1cwt. did in the first place, as only moisture has been lost, so that the adjustment is simple, and instead of adding anything to bring it up to the former condition, simply a lesser weight should be applied per acre. (2) Does not appeal as warranting any reply, unless, of course, the buyer is anxious to pay more for cartage and railage than is necessary. (3) The Government has not undertaken to analyse manures free of cost in case of dispute, but any person may have a sample of superphosphate tested for water soluble phosphate of lime at a fee of 10s. 6d. This amount is also charged for each determination of a constituent in any other fertiliser.

The Yadnarie Agricultural Bureau asks what guarantee the public have that super. purchased is up to standard.

Mr. Quinn replies—The guarantee received by the public that superphosphate and other fertilisers are up to the standard is given in the form of an invoice by the vendor, which the purchaser should demand in every instance. The guarantee contained in this invoice must coincide with that declared and registered with the Inspector of Fertilisers in Adelaide. The Fertilisers Inspector procures samples whenever possible from the consignments or manufactured lots, and has them analysed to see that the guarantee is maintained. If the purchaser suspects the fertiliser to be inferior to the guarantee he should take a sample and seal it in the presence of the seller and forward it along with the invoice containing the guarantee to the Government Analyst, or some other competent analyst, who usually determines the water soluble phosphatic content for 10s. 6d. In special cases, the Inspector of Fertilisers has tested samples from disputed lots, but unless a duly appointed inspector takes them in the presence of the vendor or his representative, the Government can take no legal action, but the private buyer has legal redress if he wishes to obtain it.

DEPARTMENT OF AGRICULTURE.

IMPORTANT CHANGES IN STAFF.

PROFESSOR PERKINS APPOINTED DIRECTOR.

Consequent on the resignation of Mr. Wm. Lowrie, M.A., B.Sc., from the position of Director of Agriculture, the Government have made some important changes in the official staff of the Department of Agriculture. Professor A. J. Perkins, who for 22 years has been connected with the department, for the last 10 years as Principal of Roseworthy College, has been appointed to the position of Director of Agriculture. Mr. W. J. Colebatch, B.Sc. (Agriculture), M.R.C.V.S. (Superintendent of Agriculture in the South-East and Manager of Kybybolite Experiment Farm), succeeds Professor Perkins as Principal of Roseworthy College ; and Mr. W. J. Spafford (Assistant Lecturer and Demonstrator of Agriculture and Assistant Experimentalist at Roseworthy College) has been appointed to the new position of Superintendent of Agricultural Experimental Work.

In the course of a statement to the press the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), commenting on the new appointments, said—" In dealing with the rearrangement of the staff the Government was very reluctant to remove Professor Perkins from Roseworthy College, where he has done such good work, or to transfer Mr. Colebatch from the South-East after he has obtained a good grasp of many of the problems confronting the producers in that part of the State. The Ministry felt, however, that there was no one in South Australia more competent than Professor Perkins to supervise and direct the agricultural experiment work, and that he could not give that work the attention it deserves, and at the same time, even with additional assistance, do justice to Roseworthy College. For those reasons, therefore, it was decided to appoint him Director of Agriculture. As such he will be chief technical adviser to the Minister, and will be responsible to the Minister for the whole of the technical staff of the department. He will also be responsible for the general experimental work and management of the Government farms throughout the State, with the exception of the Roseworthy Agricultural College, the immediate responsibility for which will be entrusted to the Principal in co-operation with the Director.

" In view of Professor Perkins' promotion, Mr. Colebatch, the next senior agricultural officer in the department, has been appointed Principal of the

Roseworthy College. During Professor Perkins' absence in Europe, three years ago, Mr. Colebatch was Acting Principal for 12 months, and the Minister and Professor Perkins are confident that he will be successful in maintaining the high standard of efficiency of the institution. The Minister realises that much of the value that should have been obtained from the experimental work conducted by the department outside the experimental farms has been lost through the want of proper supervision and the keeping of records. As it is intended to do a good deal in that direction in various parts of the State, Mr. W. J. Spafford, who has been assistant to Professor Perkins in the experimental operations at Roseworthy, has been appointed Superintendent of Experimental Work, and will, under the instructions of the Director, personally supervise this outside work. The Director of Agriculture will be responsible for the South-Eastern experimental work, and in this will have the benefit of Mr. Colebatch's experience. Applications will shortly be called for the post of Manager of the Kybybolite Experimental Farm.

"While the various technical officers will remain under the general supervision of the Director, the policy previously outlined in respect to their work will be adhered to. In the course of their duties both the Director of Agriculture and the Superintendent of Experimental Work will naturally visit the various parts of the State, particularly those where experimental centres are situated, and, with the co-operation of the Agricultural Bureau, arrangements will be made for them to deliver lectures. The Director, where possible, will attend country conferences of the Agricultural Bureau, in order to keep the members in touch with what the department is doing in their respective districts. A number of minor appointments are involved in these changes, and they will mostly be filled by officers already in the department, as the Government is of opinion that opportunity should be given to promising young officers with local training to justify the confidence reposed in them by their superior officers. Steps are being taken to select a suitable area of land beyond Minnipa Hill, on the route of the Minnipa to Cape Thevenard railway, for an experimental farm."

It is understood that Mr. Wm. Lowrie has purchased the Battunga Estate, near Macclesfield, and that he intends devoting his energies to mixed farming. Those acquainted with his great services to agriculture in this State will welcome the announcement that he intends to remain in South Australia, and will wish him the very best of success in his new undertaking.

ROSEWORTHY AGRICULTURAL COLLEGE.

FIFTH REPORT ON THE PERMANENT EXPERIMENT FIELD, 1905-1914.

By **Arthur J. Perkins**, Principal Roseworthy Agricultural College, and W. J. **Spafford**, Assistant Experimentalist.

INTRODUCTORY.

Experimental work bearing on manures, rotations, &c., has absorbed much of the activities of the staff of the Roseworthy Agricultural College Farm ever since its inception in 1883 ; but whereas, in earlier years, it had been customary to make work of this kind fit in with the ordinary farm cropping, in 1904 it was thought advisable to set apart for this purpose a special block of land, to which the name of " Permanent Experiment Field " was given. Agricultural experimental work generally can never present that definiteness in results that characterises those obtainable in a chemical or physical laboratory; there are, as a rule, too many more or less capricious factors which have to be taken into consideration. Of these the chief is, of course, the weather. Doubtless, with sufficient experience of any given locality, we are able, as a rule, to define its average weather conditions ; on the other hand, the existence of a normal average implies the presence on either side of it of opposing extremes, which may rule a season when we least expect it. It follows, therefore, that single year experiments are as a rule without practical value, since the results derived from them will hold good only under similar seasonal conditions. The value, therefore, of the solution to any agricultural problem will depend mainly on the extent to which it can be proved to correspond to the normal average weather conditions of any district; and, in our view, the only feasible way to secure results of this kind consists in patiently accumulating year after year data bearing on the same subject in the same way that weather data are accumulated. In the course of time the means of these data will offer the most accurate solution to any agricultural problem that may have been taken up. In other words, the practical value of agricultural experimental work depends very largely on its continuity; and this, perhaps, is the chief claim that can be put forward in favor of the innovation introduced for the first time in 1904.

PREVIOUS REPORTS.

Four reports bearing on results secured in the Permanent Experiment Field have already been published in the pages of the *Journal of Agriculture,* and subsequently in pamphlet form. The first report appeared in 1906, the second in 1907, the third in 1909, and the fourth in 1911.

Although in the main the original scheme of work outlined in 1904 has been adhered to throughout, necessity and experience have from time to time led to various modifications, which have been duly noted in earlier reports, and to which further notice will not be made. Some of the experiments originally undertaken, for instance, have been definitely closed and finally reported upon in the earlier reports ; those desirous of further information on the subject are therefore referred to what has already been published on these points.

THE PERMANENT EXPERIMENT FIELD.

Originally the Permanent Experiment Field consisted of 122 acres, divided up into 61 two-acre plots. In 1911 another 10 plots were added to the original ones, making the area of the field about 142 acres. The soil of this large field is on the whole fairly uniform in character; it consists of tolerably strong loam, which originally carried scattered groups of Murray box (*Eucalyptus largiflorens*), and may be looked upon as typically good wheat land. The only noticeable irregularity in the character of the soil of this field is met with in three or four of the plots, in which are to be found slight rises of travertine limestone, with its characteristic covering of loose, light soil ; soil of this kind carries mallee (*Eucalyptus dumosa, oleosa, &c.*) in the way of natural vegetation. The areas concerned are, however, too small to exercise any appreciable influence over the results we shall have to record.

Apart from this field, but immediately to the north-west of it, 15 new plots, 2·82 acres in area each, were set out in 1909. These plots are known as the Grainger Superphosphate Plots, and, as they cover similar work to that done in the Permanent Experiment Field, results derived from them will be considered in this report.

ANALYSIS OF THE NINE SEASONS UNDER CONSIDERATION.

We shall have to consider the results of nine consecutive seasons—1905-1913 ; it is essential, therefore, that we should from the outset have a brief account of the salient features of the individual seasons concerned. We append, in the first place in Table I., a full account of the yearly rainfalls comparatively with the means of the 30 years of which we have local record.

TABLE I.—*Showing the Yearly Rainfall, Month by Month,* 1905-1913, *comparatively with the Means of* 30 *years,* 1883-1913.

	1905. Inches.	1906. Inches.	1907. Inches.	1908. Inches.	1909. Inches.	1910. Inches.
January	2·27	0·00	0·05	0·48	0·75	1·72
February	0·13	0·08	0·33	0·43	0·28	0·00
March	0·08	2·64	0·17	1·09	1·17	4·43
April	2·10	0·45	2·79	0·76	1·91	0·23
May	2·24	0·99	1·96	3·36	2·89	3·20
June	2·07	2·84	1·57	2·89	1·84	2·81
July	2·58	1·99	1·15	1·42	3·80	2·86
August	0·87	3·35	2·25	1·79	4·56	1·32
September	1·17	2·65	1·08	3·09	1·52	2·64
October	2·95	1·77	1·22	2·15	2·55	2·5
November	0·25	2·26	1·86	0·07	2·08	1·1
December	0·00	0·70	0·62	0·21	0·70	0·9
Totals	16·71	19·72	15·05	17·74	24·05	23·8

	1911. Inches.	1912. Inches.	1913. Inches.	1905-13. Inches.	Means. 1883–1913. Inches.
January	0·00	0·09	0·11	0·61	0·86
February	2·13	0·21	1·94	0·61	0·50
March	0·66	0·70	1·63	1·40	0·88
April	0·33	0·91	0·31	1·09	1·74
May	1·79	0·19	0·31	1·88	1·80
June	2·33	1·68	0·22	2·03	2·65
July	1·56	1·87	0·69	1·99	1·91
August	0·68	3·19	1·64	2·18	2·09
September	2·36	2·43	2·55	2·17	1·79
October	0·37	0·94	3·89	2·04	1·60
November	0·04	1·84	1·21	1·20	1·04
December	1·44	0·92	1·16	0·74	0·78
Totals	13·69	14·97	15·66	17·94	17·64

A comparison of the mean total rainfall for the nine years concerned—1905-1913—with that of the 30 years covered by our records—1883-1913—shows that the total yearly rainfall over this period has been fairly normal, at all events in so far as the mean yearly quantities of rain received are concerned. It may be noted, too, that the results referred to in this report concern five years in which the total rainfall was below the normal average, viz., 1905, 1907, 1911, 1912, and 1913 ; three years in which the total rainfall was above the normal average, viz., 1906, 1909, and 1910 ; and one year in which the total rainfall was almost exactly normal, viz., 1908.

From the point of view of crop growth, however, "distribution" in the matter of rainfall is of far greater importance than the mere yearly total. We have, therefore, summarised in Table II. what may be termed "useful" rain from the point of view of cereal crops, for the nine seasons in which we are concerned comparatively with the mean distribution of the previous 30 years.

TABLE II.—*Showing Distribution of "Useful" Rain,* 1905-1913, *comparatively with Mean Distribution of* 30 *years,* 1883-1913.

Years.	Seeding Rain (April-May)	Winter Rain (June-July)	Spring Rain (Aug.-Oct.)	Early Summer Rain (Nov.)	Total "Useful" (April-Nov.)	Rain without Influence on Cereals.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1905	4·34	4·65	4·99	0·25	14·23	2·48
1906	1·44	4·83	7·77	2·26	16·30	3·42
1907	4·75	2·72	4·55	1·86	13·88	1·17
1908	4·12	4·31	7·03	0·07	15·53	2·21
1909	4·80	5·64	8·63	2·08	21·15	1·90
1910	3·43	5·67	6·51	1·18	16·79	7·08
1911	2·12	3·89	3·41	0·04	9·46	4·23
1912	1·10	3·55	6·56	1·84	13·05	1·92
1913	0·62	0·91	8·08	1·21	10·82	4·84
Means—						
1905–13	2·97	4·02	6·39	1·20	14·58	3·36
1883-1913	3·54	4·56	5·48	1·04	14·62	3·02

If again, we compare the means of the nine years that concern us—1905-13—with those of the 30 years of which we have record—1883-1913—we shall see that the mean total "useful" rain during these years was practically normal. In the matter of distribution we may note that, whilst the seeding and winter rains (April-July) were below the normal means (a little over an inch), the spring rains (August-October) by their greater copiousness compensated the winter shortage.

Finally, there remains for consideration what may be termed "fallow" rains, *i.e.*, rains of the preceding season falling on the land whilst it lay in the state of bare fallow between the months of August of one year and of March in the succeeding year. Data concerning these "fallow" rains have been summarised below in Table III. :—

TABLE III.—*Showing "Fallow" Rains—August 1st of one year to March 31st of succeeding year*—1905-13—*comparatively with mean of* 30 *years*—1883-1913.

		Inches.			Inches.
Season	1904–05	7·18	Season	1910–11—	11·41
"	1905–06	7·96	"	1911–12	5·89
"	1906–07	11·26	"	1912–13	13·00
"	1907–08	8·96			
"	1908–09	9·51	Mean	1904–1913	10·30
"	1909–10	17·56	"	1883–1913	9·54

All that need be noted for the present in this connection is that over the period of nine years, between 1905 and 1913, crops sown on bare fallow had the advantage of slightly more "fallow" rain than is usually the case in the district.

GENERAL CHARACTERISTICS OF THE NINE SEASONS.

Finally, we summarise briefly the general characteristics of the nine seasons concerned.

Season 1905-06 was characterised by very favorable seeding weather ; by a cold wet winter, without, however, much frost ; by a late cold spring ; and finally by very favorable ripening weather. Both hay and grain yields were exceptionally heavy and of excellent quality. The general College Farm yield of hay was represented in this season by 3 tons 5cwts. 67lbs. to the acre, and the general wheat yield by 24bush. 11lbs. to the acre.

Season 1906-07 opened with unfavorable seeding weather, followed by a very dry, though mild, winter. The spring months were on the whole unusually moist; unfortunately high temperatures accompanied by severe northerly winds set in rather suddenly, and blighted off many of the crops. The hay crops, although bulky in appearance, did not weigh well, and were poorer in quality, whilst much of the grain was shrivelled and inferior. The general College Farm hay average was represented by 2 tons 11cwts. 90lbs., and the wheat average 14bush. 30lbs. to the acre.

Season 1907-08 opened with favorable seeding weather, succeeded, however, by a very cold dry winter ; 18 heavy frosts were recorded this winter. Spring months were both dry and hot, and both hay and grain yields were light, although of good quality. The general hay average on the College Farm was represented by 1 ton 15cwts. 108lbs., and the general wheat average by 13bush. 20lbs. to the acre.

Season 1908-09 opened with favorable seeding weather, followed again by a cold dry winter, amply compensated for, however, by copious September and October rains. Ripening weather, too, was very favorable ; and in the end both hay and grain crops both heavy in yield and of excellent quality. The general hay average on the College Farm was represented by 2 tons 7cwts. 5lbs. to the acre, and the wheat average by 22bush. 14lbs. to the acre.

Season 1909-10 again opened with favorable seeding weather, albeit at times somewhat wet for field operations. The winter months were exceptionally wet, and many crops in the district were under water for several weeks, much to their detriment. Spring months were very moist and favorable, and all crops were most promising in appearance until early summer, when some of the most forward were slightly blighted off by hot weather. In the end both hay and grain crops were very heavy and of exceptional quality. The general hay average on the College Farm was 2 tons 15cwts. 68lbs. to the acre, and the wheat average 25bush. 5lbs. to the acre—the highest grain average hitherto recorded on the College Farm.

Season 1910-11 was characterised chiefly by unfavorable seeding weather, followed by exceptionally wet winter and spring months. The ripening period was favorable. Eventually hay crops were very heavy, but grain crops rather light and poor in quality. The general hay average on the College Farm was represented by 2 tons 7cwts. 31lbs. to the acre, and the grain average 17bush. 26lbs.

Season 1911-12 was remarkable for the general shortage of the rainfall ; seeding rains, winter rains, spring rains, and early summer rains were one and all below the normal average of the district, moreover seeding rains did not reach us until the middle of May. Finally, November was unduly hot and hindered the ripening off of the grain crops. Our hay crops were of fair quality and averaged on the farm 1 ton 8cwts. 6lbs. to the acre, whilst the farm wheat crops averaged 14bush. 17lbs. to the acre.

Season 1912-13 was again a season of low rainfall. There were practically no seeding rains ; rain sufficient to bring about the germination of sown crops did not come until the last week in June. Winter rains were fair, although still below the normal mean, whilst spring and early summer rains were exceedingly copious and well timed. Towards mid October College crops promised to be exceptionally heavy ; unfortunately the latter end of the month proved very dry and hot, and the crops experienced a rather severe set back. The average hay yield on the College Farm was 1 ton 14cwts. 90lbs. to the acre, and the average wheat yield 19bush. 36lbs. to the acre.

Season 1913-14 can claim the distinction of standing out as the worst season in our records. We have to note for this season almost complete absence of both seeding rains and winter rains, with the result that crops that had been sown in April and May did not germinate until the beginning of August ; spring rains, on the other hand, were abnormally heavy. These late germinating crops made rather rank growth in the spring, and ultimately succumbed to red rust and untimely hot north winds. The College Farm hay and wheat yields were the lowest on our records, viz., for hay, 16cwts. 7lbs. to the acre, and for wheat 6bush. 32lbs. to the acre.

AVERAGE YIELDS OF THE PERMANENT EXPERIMENT FIELD, 1905-1911.

Now that we have defined briefly the characteristics of the seasons with which we are concerned, it should prove of some interest, in the first instance, to endeavor to trace out their exact influence on the average yields of the plots of the Permanent Experiment Field. A careful examination of this question should enable us to determine the relative importance of individual climatic factors on cereal growing in the district in which we are placed.

In this connection, however, we are not in a position to group together in a general average the yields of all the plots of the Permanent Experiment Field, and this because, during the nine years that concern us, variations have from time to time arisen in the general treatment of some of the plots. We have, however, 15 pairs of plots scattered over the field, and representing an area of about 30 acres, the treatment of which has never varied since 1905. All these plots represent wheat preceded regularly by one year's bare fallow ; in 11 of the plots the land comes under wheat regularly in alternate years ; and in four of them every third year, a year of ordinary pasture intervening between the last wheat crop and the bare fallow. Thirteen of these plots are variously manured, whilst two of them have remained permanently unmanured since 1904.

Throughout these nine years the same variety of wheat, viz., King's White, has been used on all the plots, with the exception of 1906, when Gluyas wheat was used instead. The average yields of these plots, therefore, are strictly comparable one with the other from year to year, and may be taken to represent fairly accurately the average yields of this field for wheat grown after bare fallow.

We have summarised below in Table IV. the average yields of these plots between 1905 and 1913 :—

Table IV.—*Showing Average Yields of* 15 *Typical Plots of Wheat preceded by Bare Fallow in the Permanent Experiment Field.*

Season.	Average Total Produce Yield.			Average Grain Yield.	
	Tons	cwts.	lbs.	Bush.	lbs.
1905	2	11	77	28	41
1906	2	2	97	19	52
1907	1	1	70	15	50
1908	2	8	25	29	50
1909	2	12	94	29	5
1910	2	6	78	20	52
1911	1	12	4	16	23
1912	1	7	105	18	1
1913	0	11	79	5	19
Means	1	17	33	20	26

By way of emphasising the importance of the results set out in Table IV. the following facts will be recalled :—

(1) The figures given represent the average yields of 30 acres of the same field over nine successive seasons.

(2) In all the plots included in this area the wheat crop was in each season preceded by one year's bare fallow.

(3) Throughout the period under consideration the various plots represented received identically the same treatment from season to season.

(4) With the exception of 1906, throughout these nine years the same variety of wheat has been availed of, viz., King's White—a variety particularly well adapted to local conditions.

From a consideration of these facts it may be gathered that the results indicated in Table IV. set out in very sharp outline the purely seasonal influences controlling the yield of wheat grown on bare fallow in this district. That this seasonal influence is very considerable may be gauged by the fact that whilst in one season the average yield of wheat is close on 30bush. to the acre in another it is only slightly in excess of 5bush. to the acre. Before endeavoring to trace out the influence on yields of individual seasonal factors, we may note that the average grain yield for the nine seasons is about 20½bush. to the acre. This average we take to represent fairly accurately the possibilities of the district, wherever careful farming practices are followed. It is perfectly true, of course, that the College general farm average does not attain to this figure—our 10-year average (1904-13) is about 17½bush. to the acre. In this connection, however, it should be stated that this general average includes the yields of numerous varieties, more or less well adapted to local conditions, which for purely experimental purposes we are compelled to grow year after year on the College Farm, and which always exercise a depressing influence on the general average.

Again, for the nine years under consideration the average yield of total produce is shown to have been 1 ton 17cwts. 33lbs. to the acre. We shall frequently have occasion in the course of this report to make use of the term "total produce," and it is perhaps as well that we should from the outset define clearly its special significance. By "total produce" we understand the total weight of the crop—straw, chaff, and grain—as it is being carted from the field to the threshing machine. We have hitherto assumed that total produce yield represented roughly what would have been the hay yield of the crop had it been cut earlier for hay purposes. We had, however, occasion in two successive years to investigate various questions bearing on the cutting stage of wheaten hay, which were reported on in earlier numbers of the *Journal*; among other things these investigations showed very clearly that between the hay-dry weight of a wheat crop cut when the grain is about to leave the milky stage, and the hay-dry weight of the same crop cut when the grain was practically ripe, there was a difference in yield in favor of the earlier cut of about 18 per cent. In these circumstances an average yield of ripe total produce to the acre of 1 ton 17cwts. 33lbs. would correspond to an average hay yield of 2 tons 5cwts. 54lbs. to the acre; and this figure we take to represent very fairly the average hay capabilities of the district under good farming practices. It corresponds fairly closely to the College general farm average for the past 10 years, which is 2 tons 3cwts. 38lbs. to the acre.

THE INFLUENCE ON YIELDS OF INDIVIDUAL SEASONAL FACTORS.

We now propose endeavoring to trace out the special influence on yields of individual seasonal factors. In any given district what may be termed average local climatic conditions represent as a rule a special combination of seasonal factors which, according to circumstances, are liable to undergo favorable or unfavorable modifications, reflected in the field by yields that are either above or below the usual average. And whilst we believe that consistently successful farming depends very largely on the extent to which general practice is made to conform to this recognised combination of seasonal factors, we cannot overlook the fact that the importance in this direction of individual factors frequently altogether overshadows the influence of other members of the combination; and it is this point which we propose eliciting for this district in the light of our nine years' records.

An examination of Table IV. will show that in three of the seasons—1905, 1908, and 1909—the average yields were considerably above the normal; in two of them—1906 and 1910—the average yields were just about normal; in three others—1907, 1911, and 1912—the average yields were below the normal; and finally in one season—1913—the average yield was very considerably below the normal. With a view to facilitating a discussion of the apparent influence of individual seasonal factors we have summarised below in Table V. the various rainfall data, distributing the seasons in accordance to the value of their respective yields.

TABLE V.—*Showing the Influence of Rainfall Distribution on Grain Yields.*

Season.	Seeding Rains (April-May). In.	Winter Rains (June-July). In.	Spring Rains (August-October). In.	Early Summer Rain (Novem.). In.	"Useful" Rain (April-November). In.	Total Rainfall. In.	Grain Yields. B. lbs.
			YIELDS MUCH ABOVE THE AVERAGE.				
1908	4·18	4·31	7·03	0·07	15·53	17·74	29 50
1909	4·80	5·64	8·63	2·08	21·15	23·05	29 5
1905	4·34	4·65	4·99	0·25	14·23	16·71	28 41
			YIELDS NORMAL.				
1910	3·43	5·67	6·51	1·18	16·79	23·87	20 52
1906	1·44	4·83	7·77	2·26	16·30	19·72	19 52
			YIELDS BELOW THE AVERAGE.				
1912	1·10	3·55	6·56	1·84	13·05	14·97	18 1
1911	2·12	3·89	3·41	0·04	9·46	13·69	16 23
1907	4·75	2·72	4·55	1·86	13·88	15·05	15 50
			YIELD VERY MUCH BELOW THE AVERAGE.				
1913	0·62	0·91	8·08	1·21	10·82	15·66	5 19
Means 1883-1913	3·54	4·56	5·48	1·04	14·62	17·64	—

A single glance at Table V. will suffice to show that in this district maximum yields are not necessarily dependent upon unusually heavy rainfall; indeed the heaviest average yield recorded—close on 30bush. to the acre—was secured in 1908, a year in which the the total rainfall almost exactly equalled the 30 years' mean for the district. On the other hand, in 1910, with a rainfall of about 6in. above the mean, the average yield was only slightly above the normal.

We may assume in a general way that, other things being equal, maximum yields are for the most part the result of an unusually favorable combination of seasonal factors; and if we concentrate our attention on the three years in which yields were very much above the average we may be able to discover what this special combination is, in so far as this district is concerned.

In the first place we shall notice that the total rainfall was almost exactly normal in 1908, an inch below normal in 1905, and about 6½in. above normal in 1909. Next, "useful" rain—April-November—was about normal in 1905, an inch above normal in 1908, and about 6½in. above normal in 1909. If, further, we look into details of rainfall distribution we shall see that each of these three seasons opened under favorable seeding conditions and with the advantage of seeding rains appreciably in excess of the normal average, whilst winter rains were normal in 1908 and 1905, and an inch above normal in 1909. Spring rains, on the other hand, were considerably above normal in 1908 and 1909, and about ½in. below normal in 1905. Finally, with the exception of 1909, November rains were too slight to carry any special influence.

On these data it would seem that of the three seasons, 1909 should eventually have shown up much to best advantage, and, but for one seasonal mishap, such undoubtedly would have been the case. Both 1905 and 1908 were free from early hot dry weather, while in 1909 a few days of unexpectedly sudden heat was sufficient to blight off the ears of many a promising crop—a misfortune which had the effect of appreciably depressing yields.

We may conclude that in this district maximum grain yields may be said to depend, other things being equal, upon the following combination of seasonal factors: First, rain between April and November slightly in excess of the normal, probably not less than 15in.; secondly, an early and favorable seeding season, with not less than a well distributed 4in. over April and May; thirdly, normal winter rains, *i.e.*, between 4½in. and 5in. in June and July; finally, the spring rains must be copious and well distributed, not less than 5½in. to 6in. between August and October. Generally speaking, with a good earlier distribution of rain, November rains are not of much value in this district. In the end, however, the most ideal of rainfall distributions may fail to lift yields above average if unexpected and sudden bouts of hot weather set in whilst the plants are still more or less soft and sappy. We are aware, of course, that it is sometimes customary to attribute unsatisfactory yields to the action of frosts whilst the wheat plants are in bloom; we find it difficult to accept this view, for this district at all events. We are certainly exposed to occasional hoar frosts in September and October; it is exceedingly rare, however, that these frosts are of sufficient intensity to affect wheat 4ft. or 5ft. from the ground.

If next we look for those seasonal factors which lead to grain yields below the average, we must note in the first place a total yearly rainfall appreciably below the normal, and particularly a low "useful" rain between April and November. In the matter of rainfall distribution, we think that a shortage in the seeding rains, such as obtained in 1906, 1911, 1912, and 1913, is the most potent factor in depressing the grain yields of wheat, and this chiefly because it generally leads to late and unsatisfactory germination which but rarely allows wheat plants to ripen off normally. If low seeding rains are followed up by a dry and cold winter the evil is much accentuated, and as a rule no amount of spring rains can lift the yields above mediocrity. We had good evidence of this in 1911 and 1912, but particularly in 1913. Finally, it may be noted that late germinated crops that are whipped along by spring warmth and copious spring rains continue soft and sappy at a late period in the year, and are always open to easy blighting by moderately hot weather and are quite powerless against red rust.

CONCLUSIONS.

Before closing this portion of the report we shall summarise below what appear to be the conclusions derivable therefrom :—

(1) In the Roseworthy district, and those similarly situated, we may look upon 20bush. of wheat, or 2½ tons of hay, as representing average yields well within the reach of those who know how to adapt farming practice to the requirements of local conditions.

(2) In the same districts 15in. to 16in. of rain well distributed over the growing period of cereals—April to November—render possible yields of 28bush. to 30bush. of wheat or 3 tons to 3½ tons of hay.

(3) In the same districts the most favorable rain distribution for maximum crops is represented by good early seeding rains aggregating 4in. to 5in. in April and May, followed by 4in. to 5in. in June and July, and by 6in. to 7in. between August 1st and October 31st. November rains are, as a rule, without significance in seasons that are otherwise favorable.

(4) In these districts the seasonal factors exercising most powerfully a depressing influence on yields, whether of grain or of hay, are as follows, in order of relative importance :—(*a*) Unduly late seeding rains ; (*b*) a shortage of seeding rains followed by a dry winter ; (*c*) a shortage of spring rains following on an unfavorable winter ; (*d*) unseasonably sudden hot weather accompanied by northerly winds in October or even in November ; and (*e*) moist warm weather in October and November leading to attacks of red rust.

ROTATION PLOTS.

Whilst in this field rotation plots have from the outset been a special feature of the work we have had in hand, circumstances have from time to time compelled us to modify both their scope and their incidence. We have had in fact to grope about in search of rotations likely to be of some practical value to the district ; nor, so far as the search is concerned, can it be said that we have as yet emerged from the purely experimental stage of the work. Various forms of rotation have been tested and, for a variety of reasons, discarded ; these have already been reported upon in earlier reports on the Permanent Experiment Field, and need not occupy us here. We shall confine our attention, therefore, to those rotations that are still retained in the present arrangements of the various plots. In this connection we shall have to consider the following types :—

(1) Two special modifications of the old Norfolk four-course rotation, viz. :—

	A		B
First year	Turnips	..	Kale
Second year	Barley	..	Oats
Third year	Pease	..	Vetches
Fourth year	Wheat	..	Wheat

(2) Two common local rotations which will serve as standards of comparison in determining the value of other rotations, viz. :—

	A		B
First year	Bare fallow	..	Bare fallow
Second year	Wheat	..	Wheat
Third year	—	..	Pasture

(3) A slight modification in the above rotations occasionally met with in local practice, and involving the introduction of summer crop, viz. :—

First year	Sorghum
Second year	Wheat

(4) A rotation including two cereal crops in succession to a year of bare fallow, viz. :—

First year	Bare fallow
Second year	Wheat
Third year	Barley

(5) A more complicated rotation, in which one year's bare fallow is made to figure only once in five years, viz. :—

First year	Bare fallow
Second year	Wheat
Third year	Leguminous fodder crop
Fourth year	Wheat
Fifth year	Barley

We have other forms of rotation in view which will be dealt with, however, in later reports.

Bare Fallow–Wheat Rotation.

(*Plots* 10 *and* 11.)

In this rotation the land comes under wheat regularly every other year, and is treated as bare fallow in the alternate years ; it is a form of rotation commonly availed of in the district, and in many other portions of the State that are similarly situated. We propose making it a standard of comparison for other forms of rotation tested, and shall therefore open the discussion with a full account of this rotation. Full details concerning results recorded between 1905 and 1913 for the two plots concerned in this rotation are shown in Table VI. :

Table VI.—*Showing* 1905-1913 *Harvest Returns from Wheat Grown continuously after Bare Fallow, with* 1*cwt. Superphosphate to the Acre.* (*Plots* 10 *and* 11.)

Year.	Total Produce per Acre.			Grain per Acre.		Straw to 60lbs. of Grain.	Bushel Weight.
	Tons	cwts.	lbs.	Bush.	lbs.	lbs.	lbs.
1905	2	11	54	28	56	139	62½
1906	2	8	100	23	43	171	58½
1907	1	8	88	20	31	97	62½
1908	2	11	26	32	46	115	64½
1909	2	7	61	29	54	118	62½
1910	2	5	98	19	49	199	64¼
1911	1	8	9	14	7	163	63¼
1912	1	6	32	18	11	102	65¾
1913	1	10	19	5	4	165	60
Means	1	17	67	21	27	141	62½

We see, therefore, from the above that land carrying wheat dressed with 1cwt. of superphosphate in every other year, and treated as bare fallow in alternate years, yielded in nine years an average of 21bush. 27lbs. to the acre. If we assume the average price of wheat to have been 3s. 6d. a bushel, this represents a gross return per two acres of £3 15s. 1d. per annum; if we assume further the rental value of the land to be 10s. an acre, and the cost of preparing the land, putting in, taking off, and marketing the crop to be 25s. an acre, this leaves a net profit of £1 10s. 1d. for two acres, or 15s. 0½d. per acre per annum.

If we look at these average returns from the point of view of hay crops we must recollect that total produce at harvest time does not represent more than 82 per cent. of the hay weight had the crop been cut at an earlier stage. Hence an average total produce yield of 1 ton 17cwts. 67lbs. represents about 2 tons 5cwts. 95lbs. of hay to the acre. The price of hay is subject to far more frequent and violent fluctuations than is the case with wheat, and introduces a speculative element in farming practice; hence, perhaps, the secret of the popularity of hay growing. In the circumstances it is not easy to get at the average gross returns of a hay crop in the district; if however we assume 35s. a ton to represent a fair average price, the average hay crop will have a gross value of £4 0s. 3d., *i.e.*, slightly more than the corresponding wheat crop. Rent, of course, remains the same, whilst the cost of handling the hay crop is not far different from that already indicated for the wheat crop; hence the average net profit for the hay crop works out to about 17s. 8½d. per acre per annum, *i.e.*, about 2s. 8d. above that of the wheat crop. It should not be forgotten, however, that these figures must vary with whatever market prices are offering for saleable produce.

It is, of course, true that even land that comes regularly in alternate years under bare fallow and wheat respectively offers a certain amount of grazing which might be made to contribute towards the gross revenues of the farm. There is, for instance, a fair amount of stubble grazing between the months of

December and March ; in certain seasons quite appreciable grazing in the early autumn and winter months before fallowing operations are completed; and finally, according to the seasons, fallow grazing is more or less plentiful. At the same time the farmer who makes it a regular practice to crop one half of his arable land and to fallow the other half is hardly likely to keep sheep, or indeed livestock of any kind other than working horses, unless there be attached to the farm a suitable proportion of rough land that cannot come under the plough. In the great majority of cases, therefore, what grazing is in the circumstances available will be utilised by the working horses, and to that extent reduce general expenses.

In the case of the two plots illustrating this form of rotation—plots 10 and 11—we have kept a record of the value of the grazing available, and have summarised the results below in Table VII. :—

TABLE VII.—*Showing the Grazing Capacity of Land treated alternately as Wheat and Bare Fallow* (*Plots* 10 *and* 11).

	Stubble Grazing—		Winter Grazing before Fallowing—	
Year.	Sheep per Acre December-March.	Gross Returns at 15s. per sheep per annum. s. d.	Equivalent Sheep per Acre per annum.	Gross Returns at 15s. per sheep per annum. s. d.
1907	—	—	0·03	13 11½
1908	—	—	0·46	6 11
1909	1·27	6 4	0·15	2 3
1910	0·76	3 9½	0·54	8 1
1911	1·08	5 5	0·49	7 4
1912	1·99	9 11½	0·00	—
1913	0·64	3 2½	—	—
Means	1·15	5 9	0·37	5 6

We see, therefore, that between 1909 and 1913 the grazing capacity of the stubbles of these plots had a value of 1·15 sheep per acre for four months (December-March), representing 5s. 9d. per acre, if we assume a ewe to yield gross revenue to the extent of 15s. per annum. These figures are on the whole below those of our general farm average, which, in "The Sheep Carrying Capacity of a Lower North Farm," were shown to be, between 1906 and 1913, 1·55 sheep per acre for the four months of stubble grazing.

Early winter grazing available before fallowing operations are completed is entirely dependent on early rains ; if these rains fail us, as was the case in 1912 and in 1913, there is no grazing available ; if the reverse is the case quite useful grazing will be available. The mean value of this form of grazing between 1907 and 1913 was represented on these plots by the equivalent of 0·37 sheep per acre per annum, having a gross money value of 5s. 6d.

The grazing value of bare fallow varies very considerably from year to year according to the character of the seasons, nor is it easy to estimate accurately on relatively small areas. We shall have to content ourselves, therefore, with the average figure indicated in "The Sheep Carrying Capacity of a Lower

North Farm" for the College farm between 1907 and 1913, viz., the equivalent of 0·25 sheep per acre per annum, representing a money value of 3s. 9d. per acre.

These several values — 5s. 9d. for stubble grazing, 5s. 6d. for early winter grazing, and 3s. 9d. for fallow grazing—are available only in alternate years, and must therefore be divided in two before they can be added to the yearly gross returns of the form of rotation under consideration. In the aggregate they will represent, therefore, an additional 7s. 6d. per acre per annum in the way of gross returns.

In conclusion, therefore, if we assume its grazing capacity to be utilised to the utmost, land coming alternately under wheat and bare-fallow will yield gross returns £4 10s. 1d. in alternate years; after deduction of rent and cost of production this becomes £2 5s. 1d., or a net profit of £1 2s. 6d. per acre per annum. Whilst at ruling rates, if hay takes the place of wheat, the figures would become £4 15s. 3d. for gross returns and £1 5s. 2d. for net profit per acre per annum.

BARE FALLOW-WHEAT-PASTURE ROTATION.

(*Plots* 17, 18, *and* 19.)

This is a form of rotation that is common enough on those farms on which sheep are kept; the wheat crop that had been preceded by one year of bare fallow, is succeeded by one year's pasture. In the majority of cases nothing is sown on pasture land of this character, and livestock are made dependent on the spontaneous vegetation that springs up on the stubbles; occasionally, however, a catch crop of rape, or some other similar crop, is roughly put in with the object of improving the stock-carrying capacity of the land. In the plots under consideration practice has varied with years; in 1906 and 1907 the plot out of cultivation was left as ordinary pasture, in 1908 it was sown to vetches, and from 1909 to 1913 to rape.

We have had several series of plots grown under this type of rotation. For purposes of comparison, however, we have thought it fairer in the present instance to take into consideration only those plots dressed with 1cwt. of superphosphate whenever they came under wheat. The harvest returns from these plots between 1908 and 1913—the only years that can be used in this connection—are shown below in Table VIII.

TABLE VIII.—*Showing* 1908-1913 *Harvest Returns from Land coming under Wheat once in three years, and dressed regularly with* 1*cwt. of Superphosphate.*

Year.	Total Produce per Acre. Tons	cwts.	lbs.	Grain per Acre. Bush.	lbs.	Straw to 60lbs. of Grain. lbs.	Bushel Weight. lbs.
1908	2	11	55	29	1	139	63¾
1909	2	10	56	26	37	152	62¼
1910	2	10	71	19	2	238	63¼
1911	1	17	69	17	51	176	61¾
1912	1	11	93	20	54	111	65
1913	0	11	48	6	8	149	60½
Means	1	18	103	19	56	161	62¾

Thus, then, over the six seasons extending between 1908 and 1913 the yield of wheat preceded by bare fallow and followed by pasture was represented by 19bush. 56lbs. of grain and 1 ton 18cwts. 103lbs. of total produce. This last figure represents about 2 tons 7cwts. 52lbs. of hay to the acre.

Over the same period of six years the yield of wheat from land alternatively under wheat and bare fallow, and treated with the same dressing of superphosphate, was 19bush. 59lbs. to the acre, and 1 ton 17cwts. 67lbs. of total produce, corresponding to 2 tons 2cwts. 58lbs.

We may conclude, therefore, in the first instance, that to leave the land out of cultivation once in three years does not, in the limited period of our observations, appear to have influenced the grain yield of the wheat crop, when compared with the yield of land coming under wheat regularly in alternate years. The calculated hay yield, on the other hand, shows an improvement of about 12 per cent.

Let us next consider what were the grazing returns from land under this form of rotation. The grazing returns during the pasture year, *i.e.*, the 12 months immediately following the wheat crop are shown below for each season in Table IX.

TABLE IX.—*Showing Sheep-carrying Capacity of Land left out of Cultivation and following Wheat dressed with* 1*cwt. of Superphosphate.*

1906–07	2·47 sheep per acre per annum.
1907–08	2·19 " "
1908–09	2·54 " "
1909–10	1·99 " "
1910–11	1·20 " "
1911–12	1·11 " "
1912–13	1·27 " "
1913–14	0·62 " "
Mean 1906–13	1·67 sheep per acre per annum.

Thus, then, in spite of the fact that the last four seasons were very unfavorable grass years, the sheep-carrying capacity of land out of cultivation between 1906 and 1913 was represented by one and two-thirds sheep per acre per annum, which represents £1 5s. 0½d. in gross returns, on the basis of 15s. per sheep.

There remains to be considered the grazing available in the years when the land comes respectively under wheat and under bare fallow. These returns are shown in Table X.

TABLE X.—*Showing Grazing available on Land coming under Wheat once in three years and dressed with 1cwt. of Superphosphate in the Wheat and Bare Fallow Years.*

Year.	Stubble Grazing.		Winter Grazing before Fallowing.		Fallow Grazing.	
	Sheep per Acre per Annum.	Gross Returns at 15s. per Sheep. *s. d.*	Sheep per Acre per Annum.	Gross Returns at 15s. per Sheep. *s. d.*	Sheep per Acre per Annum.	Gross Returns at 15s. per Sheep. *s. d.*
1907	—	—	0·87	—	—	—
1908	—	—	0·19	—	—	—
1909	0·84	—	0·51	—	—	—
1910	0·21	—	1·02	—	—	—
1911	0·14	—	0·57	—	—	—
1912	0·66	—	0·00	—	—	—
1913	0·76	—	0·00	—	—	—
1914	0·23	—	—	—	—	—
Means.......	0·47	7 0½	0·45	6 9	0·25	3 9

If, therefore, we combine the results in Table IX. with those in Table X. we see that in the course of a year the average sheep-carrying capacity of land coming under wheat once in three years was represented by 2·84 sheep for three acres, representing gross returns to the amount of £2 2s. 7d. at the rate of 15s. per sheep. It may be remarked that these figures represent close on a sheep to the acre for the whole of the arable area of a farm worked on these principles.

We are now in a position to compare the net returns of this form of rotation with those previously indicated for land coming in regular alternation under bare fallow and wheat. In the first place it must be stated that the figures for the two-course rotation must be recalculated so as to make them correspond to the six seasons of which we have record for the three-course rotation, viz., 1908-1913. We append below in Table XI. a statement to that effect (1) for the crop taken as grain, and (2) for the crop taken as hay.

TABLE XI.—*Showing Calculated Receipts and Expenditure for Wheat grown in regular alternation with Bare Fallow,* 1908-1913.

WHEAT CROP CUT FOR GRAIN.	£ *s.* *d.*	£ *s.* *d.*
Receipts—		
Grain crop..	3 9 11	
Grazing	0 15 0½	
Two years' receipts	4 4 11½	
Six years' receipts	—	12 14 10½
Expenditure—		
Two years' rent	1 0 0	
Cost of production....................................	1 5 0	
Two years' expenditure	2 5 0	
Six years' expenditure	—	6 15 0
Balance of receipts over expenditure per acre for six years	—	**£5 19 10½**
Balance of receipts over expenditure per acre per annum	—	**£0 19 3¼**

Wheat Crop Cut for Hay.

	£	s.	d.	£	s.	d.
Receipts—						
Hay crop	3	14	5			
Grazing	0	15	0½			
Two years' receipts	4	9	5½			
Six years' receipts		—		13	8	4½
Expenditure—						
Two years' rent	1	0	0			
Cost of production	1	5	0			
Two years' expenditure	2	5	0			
Six years' expenditure		—		6	15	0
Balance of receipts over expenditure per acre for six years		—		£6	13	4½
Balance of receipts over expenditure per acre per annum		—		£1	2	6¾

In Table XII. below we have summarised, on similar lines, receipts and expenditure from land carrying wheat once in three years.

Table XII.—*Showing Calculated Receipts and Expenditure from Land carrying Wheat preceded by Bare Fallow once in three years,* 1908-1913.

Wheat Crop Cut for Grain.

	£	s.	d.	£	s.	d.
Receipts—						
Grain crop	3	9	9			
Grazing	2	2	7			
Three years' receipts	5	12	4			
Six years' receipts		—		11	4	8
Expenditure—						
Three years' rent	1	10	0			
Cost of production	1	5	0			
Three years' expenditure	2	15	0			
Six years' expenditure		—		5	10	0
Balance of receipts over expenditure per acre for six years		—		£5	14	8
Balance of receipts over expenditure per acre per annum		—		£0	19	1¼

Wheat Crop Cut for Hay.

	£	s.	d.	£	s.	d.
Receipts—						
Hay crop	4	3	1			
Grazing	2	2	7			
Three years' receipts	6	5	8			
Six years' receipts		—		12	11	4
Expenditure—						
Three years' rent	1	10	0			
Cost of production	1	5	0			
Three years' expenditure	2	15	0			
Six years' expenditure		—		5	10	0
Balance of receipts over expenditure per acre for six years		—		£7	1	4
Balance of receipts over expenditure per acre per annum		—		£1	3	7

A comparison of these two statements—Tables XI. and XII.—will show that, even when full allowance is made for the grazing capacity of land on which wheat is made to alternate regularly with bare fallow, there is practically no difference between the balance of receipts over expenditure of this rotation, per acre per annum, when compared with that of land carrying wheat once in three years and grazed every third year. Indeed, when the wheat crop is cut for hay there would appear to be 1s. per acre per annum to the advantage of the latter practice. We are, of course, quite prepared to admit that the figures given represent no more than average estimates, liable to vary very widely with circumstances. It is, at the same time, satisfactory to note that to miss one year's cropping in six does not necessarily involve one in pecuniary loss. It should be added, too, that we have dealt with the results of six successive seasons only. We quite anticipate that in the course of time the advantage in favor of grazing will become more marked, since whilst on the one hand organic matter will be accumulating in the land, on the other it will gradually be wasting away under the influence of oft recurring years of bare fallow, much to the detriment of the mechanical condition of the land, and ultimately of its fertility too.

In the examples that we have considered we have dealt with land dressed regularly with 1cwt. of superphosphate every time it came under wheat. We shall have occasion to show that this dressing is not advantageous from the grazing point of view; and had we made our comparisons between plots dressed with 2cwts. of superphosphate instead of with 1cwt., results would have been even more strikingly in favor of the practice of leaving land out for grazing every third year.

(*To be continued.*)

Haymaking

INTER-STATE CONFERENCE OF MINISTERS OF AGRICULTURE.

SUMMARY OF PROCEEDINGS.

The annual inter-State conference of Ministers of Agriculture, one of the most noteworthy events connected with the primary producing interests in Australia, was held in Brisbane on May 19th and 20th. With the exception of Western Australia, all the States were represented by the respective Ministers and some of their principal departmental officers.

In the course of the proceedings numerous questions of importance were discussed, and decisions which, in many cases, will tend to facilitate the inter-State trade in various agricultural products, necessarily subject to inspection in order to prevent the introduction of disease, were arrived at. Particular attention was given to the restrictions imposed by Western Australia on the importation of potatoes, and the heavy inspection fees charged, amounting to 15s. a ton. This is a severe tax on the Tasmanian and Victorian exporters, and was regarded in the nature of an import duty rather than a fee to cover the necessary cost of inspection. In the other States the fee varies from 6d. to 1s. a ton, and it was, therefore, decided to bring the matter under the notice of the Federal Government in the hope that more reasonable provisions could be secured.

Fruit Nomenclature and Export.

In view of the confusion caused in the local market and in the export trade, as well as among purchasers of fruit trees, it was resolved that a fruit nomenclature committee, consisting of representatives of each State, should be appointed to investigate and report on the correct names to be used for the different varieties of fruit. It was decided, at the instance of New South Wales, that in connection with the inter-State trade second-hand cases might be used for forwarding fruit direct to jam-makers, on condition that the manufacturers entered into a bond to treat all such second-hand cases in such manner as might be prescribed by regulation. As in the eastern States there exist a number of diseases which are not present in South Australia, the Minister of Agriculture for South Australia intimated that he would be unable to give effect to this resolution.

It was determined to recommend to the various States the adoption in the list of Australian standard fruit cases an improved Canadian case, which the

New South Wales representatives mentioned had been modified to suit Australian conditions. It now measures 20in. by 10in. by 11½in. inside, and has been accepted not only by Canadian shippers, but also by the Italian exporters of citrus fruits. Considering the large quantities of American apples and Italian citrus fruits imported into the eastern States, it was considered desirable to adopt this case in order to avoid the necessity for repacking the fruit when sold on the local market. The New South Wales Fruit Expert was also strongly in favor of it for local use.

In a report Mr. Crowe (Victorian Superintendent of Exports) suggested for export use a box measuring 18in. by 14¾in. by 10in. inside measurements. This is a slightly different shape to the present standard export case, and 25 of these will go to the ton instead of 23, and sometimes 24, of the present boxes. The saving in freight alone by the adoption of this case Mr. Crowe estimated at £10,000 to £15,000 on the Commonwealth oversea export for the current year. The case was carefully inspected by the experts from the other States, some of whom were of opinion that the ¼in. wood used for the sides, top, and bottom was too weak, and that further the timber would not be cut in general trade work sufficiently accurate to make the saving in space possible. It was pointed out that by the slight alterations effected during the past two years most of the shipments from South Australia were now going 24 cases to the ton, instead of 23, as in former years. It was resolved that the matter should be further investigated by the respective States.

Reports were submitted by Victoria and South Australia on the question of the decay of fruit in cold storage and in transit to market, and it was decided that each State should be asked to record the data received from the various Agents-General or Trade Commissioners in respect to the carriage of fruit to Great Britain, the condition of the fruit when it arrived, and any particulars concerning the causes of injury.

The proposals of two citrus growers in Italy regarding the treatment of citrus trees to cause them to produce fruit during the warm weather instead of during the winter months was referred to the experts of the various departments to make investigations and experiments in connection with the possibility of doing this. It was admitted that it would be of immense value to Australia if, instead of oranges and lemons ripening in the winter, when there was relatively little demand for them, the fruit could be made to mature in the warm weather, as was claimed to be possible by the Italian growers. Mr. Allen (fruit expert of New South Wales), who recently returned from a visit to Europe, stated that the desired result had been accomplished by some lemon growers of Sicily.

It was resolved to approach the various shipping companies and ask for certain alterations in respect to the loading and stacking of fruit in order to prevent much injury which now occurs.

STANDARD FOR FUNGICIDES.

The conference recommended that all the States, which had not already done so, should be urged to pass legislation to provide for the adoption of standards for fungicides and insecticides, and for the protection of purchasers of such goods. It was also decided that the agricultural chemists of the various States should, in the meantime, confer and draw up a set of standards to be incorporated in the regulations under such legislation. It was pointed out that it was essential that each State should, so far as possible, adopt the same standards as to what might or might not be included in insecticides and fungicides known under certain names, as it would be impossible for manufacturers to carry out their business satisfactorily if they had to adopt a different formula for the different States.

WHEAT STANDARD COMMITTEE.

At the instance of Victoria and New South Wales the conference resolved :—"That a wheat standard committee be appointed in each State by the Government for the purpose of fixing the f.a.q. standard sample each year, and that such committee consist of seven members, three representing the wheat exporters, two representing the wheat growers, and one the milling trade, with the Minister of Agriculture, or an officer deputed by him, as chairman."

EXPORT BUTTER.

Reports were submitted by the Ministers of Agriculture for Victoria and South Australia on matters connected with the sale of butter in Great Britain. Resolutions were carried affirming (1) the desirableness of compulsory grading of butter for export ; (2) the principle of compulsory grading of creamery and factory butter for inter-State trade ; (3) that all cream purchased by factories should be paid for according to quality ; (4) that butter for export graded as superfine and first grade should have the grade stamped on the boxes, and that the factory should be compelled to grade its butter, and pack it under registered brands representing such grades ; (5) that all cream graders and testers at the butter and cheese factories should be required to pass an examination, such certificates of competency, issued by the respective departments, to be inter changeable between the States ; (6) that the representatives of each State in London should meet periodically, and consult with each other with a view to report to their respective Governments on the best method of distributing butter in the United Kingdom ; (7) that the temperature at which butter is shipped should, so far as possible, be reduced from 30° F. to 20° F., and the carrying temperature from 15° to 10°, it having been demonstrated that the butter carried better at the lower temperature.

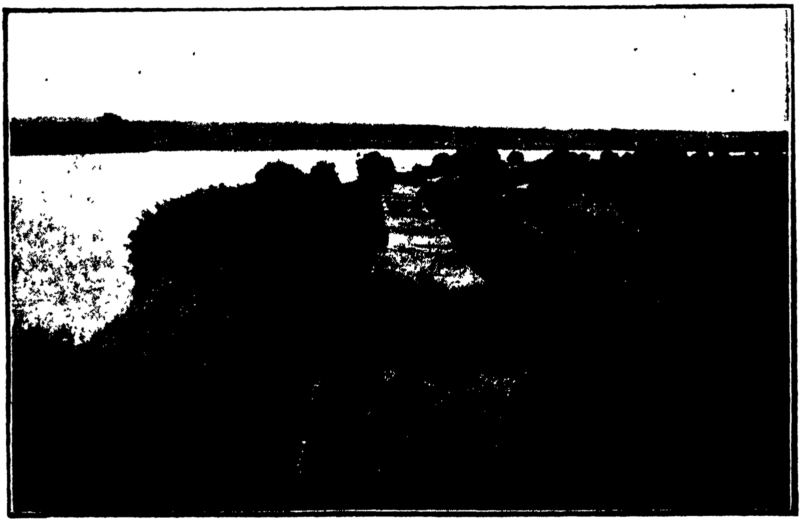
In respect to the question of coloring matter in margarine it was explained that in the eastern States the sale of margarine containing coloring matter is prohibited, but owing to there being no prohibition in South Australia, colored margarine is being manufactured in both New South Wales and Victorian factories, and shipped to South Australia. The Ministers were unanimously of opinion that the addition of coloring opened the way to fraud on the consumers, and was also dangerous to the dairying industry, and in view of this fact it was resolved that the Governments of the various States should be urged to refuse to adopt the recommendation of the pure foods standards committee that the coloring of margarine should be permitted.

SEA CARRIAGE OF PRODUCE.

The conference recommended the joint purchase of 10 thermographs, of the standard adopted and tested by the Canadian Government, for installation, with the consent of the steamship companies, in vessels engaged in carrying perishable produce overseas, to secure a reliable record of the temperature prevailing in the hold during the voyage, and the condition under which the produce carried at such temperatures arrived in Great Britain.

BRANDING HIDES.

At the instance of Victoria it was decided that efforts should be made by the departments in the different States to ascertain the best methods of utilising the least valuable portions of the hides of cattle for branding purposes, as the estimated loss by the present system of branding on the loins, rump, and ribs amounts to more than £400,000 per annum.



River Murray Reclamation Works.

THE PRINCIPLES AND PRACTICE OF PRUNING.

Address by Mr. GEO. QUINN, Horticultural Instructor.

The following address on "The Principles and Practice of Pruning" was delivered by Mr. Geo. Quinn, Horticultural Instructor, on the occasion of the annual pruning competitions held under the auspices of the Clare Agricultural Bureau :—

"The theory of pruning may be summed up as the accumulated observations of the behavior of plants when subjected to certain operative treatments under known conditions of soil, climate, and general vegetative activities. Like every other subject involving the records of natural phenomena, it must at once be admitted that the sum of our knowledge of this art is not to be claimed as a discovery of any given age or generation of gardeners, but rather is it made up of gradual accretions, which have little by little dawned in upon our inquiring minds. In the more advanced stages of the study of the application of the art of pruning come in all those diversities of treatments arising from the great variety of trees and plants which are submitted to the processes of pruning. These, however, cannot be claimed to belong to the basic principles which underlie pruning. Again it is often stated that everyone prunes differently, and every pruner has a different idea or set of ideas upon what he deems to be the proper method. Whilst judged by results all of these may not be wholly wrong, it would be folly to claim that they are wholly right. It would seem to be an incontestable statement that all pruning must be based upon the fact that the plant upon which our operations are performed is a living organism endowed with certain physiological functions, and our pruning can only prove successful in so far as it is in keeping with a proper conception of those functions.

"Assuming that the conditions of soil and climate are such as may be deemed reasonably appropriate to the growth of the plants under treatment, I wish to draw your attention to a few observed facts in the growth of plants which appeal to me as containing some basic underlying principles which alone can guide the pruner into following correct practices :—(1) The value of foliage to the plant. (2) The advantages accruing to growths securing a vertical position. (3) The relative disadvantages of a procumbent position. (4) The mutual relationship between roots and branches. (5) The relation of vegetative activity to fruit production. (6) The primary natural object of fruit production.

"Under the first heading we know that the greater the area of the foliage spread out into the sunlight the more rapidly will the manufacture of those compounds which are known under the general term of elaborated sap take place. The solidified form of these compounds we view later as leaves, stems, and shoots. How very important this fact is to the pruner, when he wishes to restrict the growth of any plant or portion of a plant, can be readily seen. The second fact arises from an unvarying rule which prevails in the growth of the plants, whereby the sap flows with greatest vigor to the highest points, thus giving them increasing advantages over those less fortunately situated. Hence it is that the pruner strives to elevate the shoots of that tree which is naturally spindly and prone in habit, and *vice versa*, if it serves his purpose he will divert the shoots of the upright, and consequently strong variety, into more horizontal positions. Why these effects should be produced we will consider later. The converse of this is found in our third proposition where the wider the angle which the shoot makes with a vertical line the more diffused does the sap become, and consequently settles into the buds of any such limb more evenly, thus causing them to grow more in unison than would be the case were any of them raised to a distinctly higher point. This fact forms the basis of all permanently successful methods of trellising grape vines or fruit trees. This question of vertical or horizontal position has an important bearing upon deciding the fate of a shoot, determining whether it shall be a lateral or fruit spur on the one hand or a strong leader on the other. Our fourth proposition indicates the mutual dependence or interdependence of the root and shoot systems of a plant. Under normal conditions of growth the sap which has been elaborated in the leaves descends by general diffusion to the roots and to the stems, shoots, and twigs, resulting in a practically simultaneous extension of all parts. The roots increase in size and length, and the stems and limbs do likewise in perfect concert. The balance therefore is complete, and should a portion of the top be removed, or some of the roots be severed, the energies of the plant are set into motion in the direction of repairing or replacing the injured member. Hence we see that when portion of the top is removed in the dormant season, and the roots are left intact, the balance is in favor of the roots, and they are enabled to send up a volume of crude sap, which finding fewer outlets, are concentrated in those parts, and acting upon the buds cause increased vigor in them, beyond what would have been the case had there been more buds to supply. On the other hand, let the root system be curtailed and the top left intact, and a lessened supply of inorganic salts is sent up and the general vigor of the top is checked. In this we can see the effect of restriction of supply, just as we saw prevention of the fullest elaboration when leaves are removed. The value of this fact comes home to the pruner in dealing with young trees recently lifted from the nursery bed, in which much of the root system has been cut off and left behind. It also appeals to him when dealing with the weakened tree which needs a stimulant in the form of giving the balance over to the root system by reducing the top by winter pruning, thus concentrating what at first is a weak supply of crude sap in fewer channels or buds, Again, it appeals to him in the case of vigorous large trees which refuse to bear adequate crops. In such cases he reduces by root pruning their possibilities for gathering mineral salts in excess, thus steadying the sap-making powers of the top and forcing a slower diffusion of that which is manufactured. This last-named phrase brings us to our fifth proposition referring to the relationship noticeable between vegetative activity and fruit production. It has been observed that within certain limits the production of fruit, or more correctly seeds, diminishes with an increased degree of vigor of vegetation in the plants. Thus, of most fruiting plants the strong growing one of mature size fruits but sparsely, and then almost without exception is the fruit borne on the laterals or spurs, which, owing to their respective positions, are kept in a more or less stinted condition. The young tree full of the flush of its vigorous development makes no pretence to fruit, but its stunted sickly fellow, lagging behind in vegetative activity, turns to a fruiting habit all too prematurely to permit of it reaching profitable proportions. This is probably to the fruitgrower one of the most important of all observed facts in the growth of his trees, and every pruner should be fully seized of its significance. Any operative treatment which is conducive to stimulated growth in a tree of average healthy development may be expected to diminish the quantity of fruit yielded, whilst the effect of that stimulation is felt, and *vice versa*, anything which tends to check the vigor of an already strongly proportioned tree will in most instances tend towards the formation of those shoots and buds which are producers of fruit crops. Thus it is that we say that the fruit-bearing habit arises from a quiescent condition in the tree or branch. The final proposition relates to the natural objective of the plant in producing fruit. This we may safely assert is the formation of seeds for reproduction of its species, and the greater number of individual fruits indicate the contained seed germs as the final result. The pruner is seized of the fact that the limit of the tree's powers in seed production stretches beyond its ability to clothe each one in the large volume of pulp which in most sorts of fruits give the greatest value. In consequence he sets himself the task of reducing the number to induce or permit an increased volume of pulp cells being formed around each one. To this end he either reduces the flower buds whilst they are yet unopened, or he plucks the immature fruits to the subsequent gain of those retained.

WHY WE PRUNE.

"We will now turn to the effect of putting these precepts into practice, and begin by asking the pertinent question—why do we prune our trees? I take it our objective may be summed up as follows:—Pruning is practised for the purpose of securing more regular crops of fruit of high quality over the longest period of years. This is the ultimate result sought, but we have first to apply it to (1) modify the natural form of the plant; (2) to stimulate or reduce the production of branches; (3) to sustain a healthy condition in the plant.

" Beginning with the tree as it arrives from the nursery we remove all broken or dead roots before planting it in its permanent position. As previously remarked its balance of roots and branches has been broken, and we must reduce the limbs to correspond with the much curtailed root area. Let me digress here by saying that if we transplanted our trees in late autumn, while the ground is still warm, the lacerated root repairs largely the injuries received whilst being lifted from the nursery bed. The elaborated sap has not yet ceased to be diffused, and the flow towards the injured roots is undoubtedly augmented by those injuries. Hence it is that whilst the top has ceased to grow and the leaves are falling, or have fallen, the root activities go on awhile with much vigor. That this descent of elaborated sap should be encouraged from every available twig, the shortening back or balancing of top with root should not be too hastily performed after transplanting takes place, but rather left until mid-winter arrives, and the lowered temperature of the soil tells us of the full period of dormancy in the plant. It is then the pruner proceeds to reduce the branches to a fewer number of buds, so as to give the root system if possible the balance of power. The return of vitality in the plant shows an increased vigor in those individual buds, resulting in a strong growth of shoots, limited as yet in number. The next winter season will see the balance again given to the root system, with similar results in wood and leaf growth in summer. This regular order may be followed for several years more or less in accordance with the development of the individual trees. As a normal stature is attained the roots need not be further encouraged to hold the balance of power, but rather should the top be left untouched in winter or the leaf spread be reduced in summer to stay their absorptive and assimilative powers so that no longer is the rapid manufacture of tree-forming compounds encouraged. If the removal of foliage and the admission of sunlight do not check this vigor, the balance of power may be given to the top much more markedly by actually curtailing the roots and thus lessening the supply of crude food materials at both ends of the chain. Assuming the treatment results in the fruiting habit becoming established, and crops are obtained, the nourishing of which leaves a lessening amount of sap for the production of wood and foliage, the danger line of over-cropping is sooner or later approached, and again the question of increasing the vigor of the tree without unduly reducing its yield of fruit becomes the concern of the grower. To this end the pruner again steps in, and either reduces the number of shoots which may possibly bear fruits, or he reduces the fruits themselves whilst they are yet in a very immature condition, thus lightening the tree's burden to its vegetative advantage.

" We may thus sum up the principles of pruning by saying that under normal conditions any reduction of the top of a tree whilst it is in leaf tends to check its vitality or vigor of vegetation, and a checked condition of growth is conducive to the production of flower buds, and possibly fruits. On the contrary, any reduction of the top during the dormant period turns in the direction of giving the balance of power to the root system at the return of spring, and this, as it has been seen, results in an increased development of roots and shoots, and, if excessive, in a reduction of the number of flower buds formed during that and possibly succeeding seasons."

THE AGRICULTURAL BUREAU.

PRUNING COMPETITIONS AT CLARE.

An encouraging feature in connection with the important work of the Agricultural Bureau is the increased attention given to the conducting of experiments and demonstrations. Three years ago the Clare Branch inaugurated an annual pruning match, and the success which has attended the fixture, both as regards the number of competitors and spectators and the keen interest taken, affords incontestable proof of the general recognition of the benefits accruing from such object lessons.

This year's competition was held on Monday, June 8th, in the orchard and vineyard of Mr. W. Pattullo. At 9·30 a.m. about 150 persons had assembled, and shortly after the competitions were in full swing, class after class—except for a brief interval for lunch—following in rapid succession. At the conclusion of the contest the judges addressed the competitors and others, pointing out and demonstrating the faults and defects of the pruning. The Secretary of the Advisory Board (Mr. G. G. Nicholls), who also spoke, urged those present who were not members of the Agricultural Bureau to join that organisation and co-operate in its useful work, one exemplification of which they had witnessed that afternoon. Much credit for the success of the competition is due to the committee of management—Messrs. J. Dux (chairman), C. Jarman, R. Hunter, J. H. Knappstein, J. Berridge, W. Pattullo, and the joint secretaries, Messrs. M. L. Nolan and P. H. Knappstein.

THE CLASSES.

Included in the test were classes for apricots, apples, peaches, currants, sultanas, and wine grapes. A class was also provided for youths—15 years of age or under—for pruning one sultana and one currant vine each. The work done in this class was very creditable indeed, and many a man would find it hard to do better work than that accomplished by some of the lads. An innovation was made in the inclusion of championship prizes for apples and peaches in the form of gold medals to be awarded to the competitors in these classes who secure the highest total for three consecutive years. The judging will be in the hands of a committee of the Bureau, and will be based upon the actual weight of marketable fruit the trees are carrying in season, as well as upon points gained in the pruning competition. Each competitor will have the same tree to handle for the three years.

A VALUABLE CONTEST.

Commenting on the contest, the Horticultural Instructor (Mr. Quinn) remarked that he thought the pruning match should command the wholehearted support of all orchard and vineyard owners who employed labor, owing to the fact that the possession of a certificate signed by a competent judge that the workman had displayed in open competition the necessary ability, skill, and decision to effectively prune certain kinds of trees and vines, was the best recommendation that he was not likely to do any harm and needed little or no instruction as to how he should set to work. On the other hand the workmen who engaged in this type of work, by pruning in the competition were gaining a standard of excellence which would go a long way toward giving them that preference which the command of skill and the proper knowledge of the practice must bestow. Consequently they would benefit in securing the highest wages, and could rightly demand such, above those who were not possessed of such qualifications.

Mr. Quinn favorably contrasted the pruning match with those he had seen in other parts of the State, in so far that not only were the competitors exceedingly keen, but that they had first class material to work upon. For example, of the fruit trees the apricots and peaches were remarkably well grown and the apple trees were of fair average character.

Sufficient work was allotted each competitor to enable him to show very clearly his knowledge of the treatment which should be given to the kinds of fruits dealt with, and, of course, the competitors were informed of the variety of the tree in each instance.

Peaches were Red May, Early Crawford ; apricots, Moorpark ; and apples, Cleopatra and Jonathan—all well-known varieties involving treatment peculiar to each.

PRIZE AND CERTIFICATE LIST.

Apricots.—Judge, Mr. Geo. Quinn ; steward, Mr. C. J. Radford (14 competitors ; maximum points, 100).—C. Glaetzer, 85 points, 1st prize and certificate ; P. Dunstan, 83 points, 2nd prize and certificate ; W. Smith, 82 points, 3rd prize and certificate. Certificates—H. Bartlett, 81 points ; A. Burgess, 80 points ; J. Butler, 80 points ; T. Taylor, 80 points ; O. Dunstan, 80 points.

Apples.—Judge, Mr. J. Kempster; steward, Mr. C. Neate (28 competitors; maximum points, 100).—W. Foreman, 94 points, 1st prize and certificate; C. Glaetzer, 87 points, and A. Burgess, 87 points, tied for 2nd, divided 2nd and 3rd prizes. Certificates—H. Bartlett, 86 points; W. Millard, 86 points; F. Mutton, 85 points; W. Smith, 83 points; B. Burgess, 82 points; W. Baker, 80 points; O. Dunstan, 80 points; H. Stewart, 80 points; H. Baker, 80 points; A. Bartlett, 80 points; C. Barber, 80 points.

Currants.—Judge, Mr. A. P. Birks; steward, Mr. E. Victorsen (32 competitors; maximum points, 100).—W. Bond, 91 points, 1st prize and certificate; O. Dunstan, 90 points, 2nd prize and certificate; T. Taylor, 89 points, and C. Barber, 89 points, 3rd prize and certificate. Certificates.—O. Ward, 88 points; J. Butler, 85 points; H. Bartlett, 85 points; C. Glaetzer, 83 points; T. Webster, 83 points; J. Ward, 82 points; H. Stewart, 82 points; M. Barber, 82 points; A. Burgess, 81 points; B. Burgess, 81 points; A. Collins, 81 points; J. Miller, 80 points; F. L. Burgess, 80 points; C. Bray, 80 points; A. Ward, 80 points.

Sultanas.—Judge, Mr. C. T. Jarman; steward, Mr. B. Lloyd (24 competitors; maximum points, 100).—H. Bartlett, 91 points, 1st prize and certificate; W. Millard, 91 points, 2nd prize and certificate; C. Glaetzer, 90 points, 3rd prize and certificate. Certificates—P. Dunstan, 89 points; T. Taylor, 88 points; S. Hill, 88 points; B. Carroll, 88 points; H. Baker, 87 points; W. Baker, 87 points; W. Foreman, 87 points; W. Bond, 86 points; W. Smith, 86 points; F. L. Burgess, 85 points; F. Knappstein, 85 points; E. O. Wishart, 84 points; W. Maynard, 84; O. Ward, 83 points; T. Webster, 83 points; A. Collins, 83 points; H. Stewart, 83 points; J Ward, 81 points; A. Ward, 80 points; J. Butler, 80 points.

Wine Grapes.—Judge, Mr. E. O. Wishart; steward, Mr. P. R. Pascoe (19 competitors; maximum points, 100).—W. Baker, 87 points, 1st prize and certificate; W. Millard, 86 points, 2nd prize and certificate; C. Barber, 85 points, 3rd prize and certificate. Certificates—A. Bartlett, 84 points; W. Bond, 82 points.

Peaches.—Judges, Messrs. Geo. Quinn and J. T. Hague; stewards, Messrs. C. J. Radford and R. Hunter (21 competitors; maximum points, 100).—J. Butler, 86 points, 1st prize and certificate; J. Ward, 84 points, and A. Dunstan, 84 points, tie—2nd and 3rd prize divided. Certificates—W. Foreman, 83 points; F. G. Hicks, 83 points; B. Carroll, 81 points; P. Dunstan, 81 points; W. Smith, 80 points.

Juvenile class for boys 15 *years or under.*—Judge, Mr. W. G. Lewcock, jun.; steward, Mr. R. Hill (maximum points, 100).—R. Birks, 94 points, 1st prize and certificate; L. Dux and G. Pattullo tied for second place—divided 2nd and 3rd prizes; certificates to each.

TO DRENCH OR NOT TO DRENCH?

A QUESTION IN EVOLUTION.

By F. E. Place, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.

A sick horse and something to pour inside him—a combination of circumstances which seems to have exercised men's minds for thousands of years. Homer tells us that outside the walls of Troy the arrows of Apollo fell thick and fast on man and beast, so that thousands died of the plague ; and an undiscovered manuscript is said to describe a scene where Achilles is in sad trouble over the sickness of his charger, and sends for Hipparchos, the priest and horse doctor, who comes and, with rich and varied ritual, prescribes and orders the administration of a drench for the suffering beast, which soon succumbs, as it cannot absorb through its lungs some quarts of burnt dog's liver suspended in thick Chian wine. Achilles seems to have his doubts as to the cause of death; which frame of mind Hipparchos deems most impious, and departs in dudgeon, warning the wrathful owner to sacrifice a cock to Aesculapius, and to be truly thankful for the skill bestowed on the operator, "For without my aid the horse might e'en have lived."

Some hundreds of years pass, and we are with Cæsar on the banks of the Rhone. The constant fording and refording have played havoc with the Roman cavalry ; the horses cough and run at the nose, and die of "Morbus." So the great commander sends for Eques Veterinarius, who, with prompt skill, holds a sick horse parade, and declares, with many mystic terms, that each patient must be drenched with 2 quarts of juice made from pounded fox lung mixed with eagle's dung. The disease is so virulent that even while being drenched the horses fall and die. Cæsar was evidently much annoyed, for he writes of the "loss of horses under that —— E. V." But later, with the calmness of a great general, he admits that, but for the quickness of the deaths following the drenching, the fodder might have been consumed and his chance of successful retreat much lessened, and so recommends E. V. for promotion, on the ground that he has been of great service to the State.

The scene changes to the Holy Land; and on the shore at Joppa, sickness and death decimate the chargers of Richard Cœur de Lion's knights; so Mareschal Knight, who is "cunning with horses and skilled withal," is consulted, specially with respect to the king's favorite Barbary charger. He prescribes large drenches of water from the Sea of Galilee, to fetch the which would mean penetrating the Saracen lines. The king is not charmed with the prospect, and hints that the horses already drenched have died more quickly and certainly than those which have not had the benefit of the valiant Mareschal's drenches; and, when night calls for truce, Richard consults one of Saladin's Arab officers, but cannot translate the word "drench." However, a Paynim Hakeem is sent for, who laughs outright at the idea, and gives the Frank a sweet-smelling gum, to be burned under the horse's nostrils, and a smooth paste to be put upon his tongue. Some days later Richard plays polo on the Barb, and in the evening the Mareschal descants at mess on the wondrous healing power of the waters of Galilee when given as a drench in large quantities, a view that is strongly upheld by the king's chirurgeon and his reverence the chaplain.

A few more centuries pass, and the Merry Monarch hands out the tinkling silver bells to the winner on Newmarket Heath; for already dour King Jamie's imported Barbs and Place's White Turk have formed the strain that later produces St. Simon and Carbine. But "the distemper," a legacy of the late unhappy wars, is spread from inn stable to farm, from farm to grange, from grange to castle, and post horses stagger on the last stage to die; the plough lies idle under the hedge. Farrier Smith is therefore in great demand, for who so clever as he at giving a drench? And that's a thing no unlearned person should attempt, for pouring oil of vitriol or spirits of salts down a horse's nostril is no lay matter. And, reader, mark the advance—now there is no hit or miss, pouring into the lungs *via* the mouth; no, with skilled attention it goes direct from nose to lungs, and the distemper troubles them no more. But one day, in the parlor of the Jolly Huntsman, Tom Ashley, who combined the lucrative trades of tanner and knacker, twitted his cousin the farrier on the fact that since he had grown too fat to drench with ease and drank too much to afford to use potent drugs, horse hides had become quite scarce; whereupon, with a round oath, the farrier gave his professional opinion that infernal drenching had killed more incarnadined horses than ever the glanders had; and who shall say he was wrong?

Yet, in the year of grace 1914, no sooner does the horse get the gripes than someone is sent galloping off for a drench, and probably for a drenching bit, for that will ensure the drench going down; yes, but where? Where the dog's liver and Chian wine went, where the fox lung juice went, where Farrier Smith's concoctions went—down the windpipe into the lungs. Why? Because the horse's nose is above his mouth and his windpipe below his gullet, and when he drinks his head is down, and his windpipe is protected by a trapdoor (the epiglottis), so that the liquid glides over it into the gullet down into the stomach. But when the patient sufferer falls into the hands of ministering angels with a drench, up goes his head, the muscles of his throat are stretched so that the trapdoor is forced open, and, being shaped like the lid of a jug, involuntarily catches the drench and tips it down the windpipe. And still the nose is used as a funnel, despite the fact that it is arranged to allow air, not liquid, to get into the windpipe; and if liquid is substituted for air it, too, has to go the wrong way after intensely irritating a very delicate organ ; and when a horse coughs he is bound to take the drench down his windpipe. Nowadays the active principles of all useful drugs can be obtained in concentrated form, and, mixed with molasses or pollard, can be put on the tongue or teeth, or tastelessly mixed with the food or drink, or inhaled in vapor form without harm; and the chorus that comes down the ages in an equine Esperanto, " Killed by drenching," will, *diminuendo pianissimo*, be lost to the ear, while the cheerful whinny of the grateful and restored patient will take its place if the question in the headline is answered in the negative.

THE "FRENLER" REMEDY FOR CODLIN MOTH.

By George Quinn (Chief Inspector under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910).

During the past couple of seasons a proprietary compound known as " Frenler " has received some prominence in a neighboring State as a remedy against codlin moth. It consists of a pungent liquid which, after being placed in jars or receptacles, is hung in the apple and pear trees at the time the moths are actively depositing their eggs upon the fruits and foliage. It has been claimed that the codlin moths are attracted by the odor of the liquid, and becoming thus enticed into the jars, are subsequently drowned. In this State the law does not recognise any remedy for this pest other than those such as spraying with lead arsenate, bandaging, &c., as prescribed by regulations framed for the purpose.

Owing to numerous inquiries from orchardists, it was decided to give the compound a trial. Mr. G. L. Wishart, Inspector of Orchards for the Northern Districts, was asked to conduct a test at Angaston. The inspector now reports as follows:—

" An old tree of the Cleopatra variety, somewhat isolated, was selected for the test, and with the exception of an early spray of Bordeaux mixture, left unsprayed throughout the season. Two wide-mouthed glass jars containing the 'Frenler' mixture were hung in the branches on October 7th, and the usual bandage of sacking placed around the butt of the tree. On January 3rd the whole tree was carefully gone over, and all fruits showing signs of tunnelling picked off, examined, and counted. On April 20th the tree was stripped of its crop, the fruit being examined and counted as before. From time to time, as the 'Frenler' evaporated, the jars were kept refilled with fresh solution, a bottleful of the concentrated 'Frenler,' costing 4s., being used during the test. The following table shows the results of the examinations of the fruits, jars, and bandages in detail."

Table showing Results of Examinations of the Fruits, Jars, and Bandages in Detail.

Date.	Fruits—Sound.	Fruits attacked at—				
		Calyx.	Calyx End.	Stem.	Stem End.	Equator.
December 30	36	48	31	11	31	20
Jan. 3 (picked)....	97	322	344	26	172	104
January 27	16	76	44	25	46	20
February 14......	23	108	59	31	43	10
February 28......	15	127	58	31	55	31
March 9	7	92	37	8	25	19
March 23	12	121	42	10	63	22
April 4	14	52	29	11	26	14
April 20 (picked) .	671	148	78	12	118	41
Totals	891	1,094	722	165	579	281

Sound fruits, 891=23·87 %; mothy, 2,841=76·13 %.

Date.	Insects Captured by "Frenler."
November 3	Codlin, 2; bees, 5; other, 6
November 17	Codlin, 5.
November 24	Codlin, 22; bees, 1; other, 2
December 1	Codlin, 14; bees, 3; other, 1
December 8	Codlin, 17; bees, 1; other, 1
December 23	Codlin, 11; bees, 5; other, 4
January 6	Codlin, 2; bees, 2
January 27	Codlin, 8; bees, 9; other 4
February 14	Codlin, 26; bees, 4; other, 3
February 28	Codlin, 4; bees, 15; other, 4
March 9	Codlin, 4; bees, —; other, 4
March 23	Codlin, 7; bees, —; other, 13
April 20	Codlin, —; bees, 2; other, 7

Totals—Codlin moths, 122; bees, 47; miscellaneous insects, 49 (including ants, beetles, flies, and small moths); codlin larvæ trapped in bandage, 179.

KYBYBOLITE AND GREEN PATCH.

CROPS AND CROPPING.

(Address by W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.)

(Continued from page 1174.)

In districts that are liable to be short of natural feed both in the autumn and early summer, and where at the same time sown grasses are apt to prove disappointing, the practice of lambing down all the ewes in May and June is open to criticism. Where ample provision is made in the shape of late summer and autumn green feed there is less to be said against the system, but it is not always possible to arrange for such provision. During the last two seasons the months of March and April have been so dry that early sown grain did not germinate till well in to May, and most of the autumn lambs had been dropped two or three weeks before the feed was ready for grazing. Again, it should not be overlooked that the ewes tupped in December and January are asked to nourish and develop their lambs during a period that is usually marked by shortage of paddock feed. It is true that with spring lambs there is the danger of an early summer, with the consequent drying off of "milking" feed, and of course there is a little more bother at shearing, but where proper care is taken to have on hand a block of kale and sorghum the spring lambs will do well, and I am confident there will be a much lower proportion of stunted weaners in them than in those reared through the cold wet winter months. Furthermore, those intended for the fat market will come in better time for the new kale than those weaned in October. What I believe to be the best practice is to lamb one half of the flock in May and the other half in September. This will enable us to do the milking ewes better and to have more feed available for the lambs when asked to forage for themselves. Unfortunately the stubble feed on these ironstone soils does not last; in fact were it not for the presence of sorrel there would be little but dry feed in any of our stubbles. Hence, if we are to grow lamb or mutton we are compelled to raise green feed, for it is well known that the short benty pastures characteristic of our country will not fatten, though it will grow fine bright wool. It is obvious, then, that in considering the crops and scheme of cropping best suited to our conditions we must first of all recognise the fact that the importance of grazing crops to cereals is very much greater than in our wheat-growing areas.

Early Green-feed.

In February, whenever the opportunity offers of sowing under favorable circumstances, or at any rate in March, whether the rains come or not, it will pay on most of our holdings to turn over a hay stubble or pea stubble and drill in a big block of green feed. So far as our experience teaches rye is undoubtedly the best grain for early sowing. Barley is better than oats, but it will not stand a dry spell like rye nor does it grow as rapidly under light rainfall. Even in droughty years rye can always be depended on to grow a fair amount of feed, and if fed early and not allowed to run to head it will thicken up in the stand and last right into the spring. About September it begins to get thin and spindly, and at this season of the year is inferior to either oats or barley. Oats do not grow quickly enough in the autumn, but they continue to shoot much later in the spring than the other cereals. The question of palatability can hardly be said to come in, as sheep will take to any of the cereals very readily when the paddocks are bare. Our usual practice at Kybybolite is to sow 1½bush. of rye with 1cwt. 36-38 min. super. per acre as early as possible. This is then grazed back when 4in. or 5in. high, and if rains are delayed it is kept down. About the end of May, when the soil is soft, the field is harrowed, about 1½bush. of Algerian oats cross-drilled in and then reharrowed. In wet autumns the later sowings of green feed should consist of Cape barley and oats in equal amounts. After the winter the heavy harrows should be again run over to spread the manure and freshen up the surface.

Hay Crops.

Generally speaking the rubble country is better suited to oats than wheat, and consequently it will pay better to make oaten instead of wheaten hay. It is sometimes asked whether it would not be wiser to grow a mixture of the two, and where they can be relied upon to produce a heavy cut the practice has its advantages. In my experience, however, to attempt to grow a mixed crop on our land without drainage is to risk too much. In very wet years in the past neither oats nor wheat have made satisfactory growth, and when a mixed crop makes poor headway the opportunity of using the stripper instead of the binder is not presented. When the drains have been provided our districts may become more trustworthy as regards cropping, and the growing of mixed hay may then be reconsidered. I do not think one can do better than sow Algerian or Calcutta oats at the rate of 1¾bush. to 2bush. per acre, with the same quantity of manure as in the case of early green feed. One advantage in growing oaten hay is that the seed can be early sown without fear of malting. Our practice is to follow the green-feed grown on pea stubble with a hay crop. The land is ploughed up in March or April, whether ploughing rains fall or not. In April the seed is sown, and as soon as rains come in the water furrows are drawn. This enables a farmer to get on with his work a dry year, and so spare himself and his teams a lot of anxiety and rush later on.

WHEAT CROP.

On our light land the best wheat crops will almost invariably be found on fallow. Good crops have been raised on "green" ploughing, and sometimes even on cultivated stubble, but as the settlements grow in years I have little doubt that the conclusion arrived at will be that it pays to fallow up in the spring for the wheat crop. With regard to the time of seeding, I have no hesitation in saying that, in my opinion, May is unquestionably the month to sow wheat. We have seen as much as 10bush. per acre less on July as against May sowings of Gallant wheat, and that in a relatively dry year. In wet autumns June sowings are too late, and I think one would be well advised to confine wheat drilling as far as possible to the month of May. If there is land to sow after that it would be more judicious to sow oats or barley. From 60lbs. to 90lbs. per acre is found heavy enough at Kybybolite, but of course each man can readily discover his own requirements, both as to the quantity of seed and manure per acre.

WHEAT HARVEST RETURNS AT KYBYBOLITE.

The following table of yields obtained at Kybybolite will indicate the comparative merits of some of the more important varieties of wheat under our conditions :—

Variety.	1913.		1914.		1913-14.	
	bush.	lbs.	bush.	lbs.	bush.	lbs.
Lott's	30	20	31	33	30	56
Fan	—		29	41	—	
Yandilla King	28	16	30	47	29	31
Bayah	29	36	29	9	29	22
Clubhead	29	51	28	51	29	21
Talavera	27	5	31	20	29	18
White Tuscan S.	25	20	31	25	28	25
Dart's Imperial	27	1	29	45	28	23
Federation	33	29	23	16	28	22
Phyllis's Marvel	—		28	12	—	
Marshall's No. 3	24	45	29	33	27	9
Baroota Wonder	22	27	30	55	26	41
White Tuscan N.	27	32	24	41	26	6
Bordier	25	34	25	21	25	27
Majestic	26	16	23	16	24	46
Gallant	25	27	21	24	23	25
Farm Averages	22	54	26	44	24	49

In fairness to Federation it should be pointed out that the 1914 crop was not grown on fallowed land. Had it been grown in the same field as Lott's it would probably have yielded quite as well, if not better, than it did the year previous. The main point to note is that the mid-season and late wheats do better with us than the early types. Of the late varieties Bordier is one of the best. It has given a good account of itself in the last two dry years, and in 1912 it yielded 19bush. as against 15bush. from Federation. It stools well, and seems a likely wheat for wet years. Like most late varieties it should be sown early. The early kinds, such as Bunyip, Golden Drop, and King's, even when late sown, do not thrive as well as the hardier wheats.

OAT CROPS.

As soon as the wheat seeding is over the balance of the oat crop should be got in as quickly as possible, and every effort should be made to complete this work by the middle of June. Algerian and Calcutta oats are the best yielders for us, and they should be sown at the rate of 1½bush. per acre. The standard dressing for wheat, oats, and barley is 1cwt. per acre of min. sup., 36-38 grade. In order to keep down drake and barley clean seed should be obtained, and to combat the attacks of smut the seed should be pickled in a 2 per cent. bluestone solution every other year. At the end of the winter all the cereal crops on the Kybybolite Farm are thoroughly well harrowed, and this I believe to be a very beneficial practice. It is also customary with us to graze the crops up to the middle of August, but personal experience is the only safe guide in a matter of this kind.

PEASE.

On clean land pease may be sown as late as August, but where there is much sorrel it is better to get them established in the winter. We sow pease in June or July at the rate of 2bush. per acre in pairs of drills. The Early Dun variety has done best with us, but possibly if they could be got in earlier, say April, the Partridge variety would yield well also. The ironstone rubble land grows pease surprisingly well with but 1cwt. standard min. super. per acre, but they will not succeed if the seeding be too light. On no account sow less than 2bush. per acre.

BARLEY.

Barley may be sown in the autumn or late winter. If early sown it should be grazed back in June or July. It is usually more convenient, however, to defer barley-sowing till July or August. A fair sample of malting barley can be grown on our soils, but they are better suited for the production of the six-rowed variety; 2bush. of seed per acre will be found sufficient.

SUMMER CROPS.

Whilst the low rainfall years are generally those of high yields, yet they are also years of scarcity as regards summer paddock feed. The last two years have brought this right home to us, and more attention will need to be paid to the raising of such crops as kale, rape, sorghum, and lucerne. The pea crop also may be used as a summer grazing for fattening off, but every farmer should endeavor to save enough seed for himself, as the price of a good seed sample is rarely much under 5s. per bushel. With a 2bush. seeding this means 10s. an acre, as against 2s. to 3s. for rape or kale. Lucerne has done fairly well at the Government Farm, Kybybolite, but in dry years the summer growth is not as stout and vigorous as I should like to see it before recommending it strongly. Up to the present we have found kale and sorghum to be the most reliable and serviceable of summer grazing crops on the ironstone country. It is not possible to go very fully into the cultivation of these, but I will briefly indicate our methods of growing them.

Rape and kale will both flourish on buckshot soils, and they should be cultivated much more extensively. They are inexpensive crops to raise, and the work of seeding falls at a convenient season. Rape fattens more rapidly than kale, and where it can be grown to advantage it should be preferred for sheep. In my own district, however, we are more appreciative of thousand-headed kale, since it is only slightly affected by insect pests, whereas the rape crop may be completely devastated by them. When the caterpillars and plant lice first appear on rape the feed may be gained if fed at express speed, but when this is done the green keep is soon disposed of and the sheep driven back on to the failing grass land again. What is wanted on the Green Patch and Kybybolite farms is a more lasting green fodder, for we have not only to provide fattening crops for the marketing of our surplus but also nutritious sheep keep during the months of January, February, and March. Kale is, to my mind, the crop that suits our needs best in this respect, though I think it a wise plan for every man to try a few acres of both rape and kale for himself to test the matter on his own block. I have noticed on the coast an odd patch of stubble kale, but I have not observed any fields of kale grown as a principal crop. This I feel sure is a defect in your farming system which you will have to remedy. When sowing kale or rape in wet districts there is nothing against the practice of mixing the seed and manure immediately prior to drilling. For kale 1lb. to 1¼lbs. per acre, and of rape 3lbs. to 5lbs. will be ample. The former is better sown through every fourth hoe, so that horsehoeing may be given if necessary. We usually make a point of running a Planet Jr. up the rows as soon as the lines become distinct, but if the land be clean good crops may be grown without any inter-tillage. With rape it is better to sow a pound or two of white mustard and drill the mixture in through every other coulter.

Sorghum and Maize.—The various kinds of sorghums, kaffir corns, and millets have all been subjected to trials at Kybybolite, and the conclusion we have come to is that early amber sugar cane, sorghum saccharatum, and imphee are far the best for us in dry years. In moist summers maize can be grown to advantage and possibly on picked spots a proportion of it might be cultivated every season ; it will not stand the dry weather, however, and having no recuperative powers, when once fed down the field is left bare. Sorghum, on the other hand, keeps springing from the crown, and may be treated like pasture. It can either be grown in wide rows to admit of after working, or, as we prefer it, through every drill, to be grazed and kept grazed down like a grass field. We sow from 8lbs. to 10lbs. per acre in September or October, but in favorable summers it could be sown right up to Christmas.

FEDERAL FRUIT COMMISSION.

THE MAJORITY REPORT.

The majority report of the Federal Fruit Commission, signed by Mr. Frank Foster (Chairman), Senators Ready and Lynch, and Mr. W. F. Finlayson, M.H.R., was laid upon the table of the Senate on June 26th. The minority statement of Messrs. S. Sampson and J. Thomson, M's.H.R., will be submitted at a later date The following digest of the report is taken from *The Register* :—

" As a result of its investigations the majority has arrived at the conclusion that a few firms in Australia control the bulk of the oversea export trade. In Tasmania the exporting firms are said to be outwardly separate entities, each operating in its own particular sphere, but the Commission found that even these were controlled by a combination operating on lines similar to those of some of the American trusts.

" Dealing with transport, the Commission points out that the absence of suitable methods offers perhaps the most serious obstacle to satisfactory marketing, and that there is room for improvement in the method of handling the fruit is also indicated in no uncertain way. Commonwealth-owned steamers and a uniform railway gauge for Australia are among the remedies for existing evils which the Commissioners put forward.

The Dried Fruit Industry.

" Investigations into the dried fruit industry revealed interesting features. The Commission found that the production of currants, sultanas, and raisins had made such rapid progress that the Australian market is almost exclusively supplied from local sources. Repeated testimonies were given to the Commission as to the high commercial value of the Australian product, which is reputedly equal, and in many cases superior, to the imported goods. This position has been secured by a successful combination of growers and a strong association of packers, their united efforts having succeeded in stimulating production, regulating prices, and supplying the public with a satisfactory article. The report goes on to say—' There is, however, some objection to the operations of the Australian Dried Fruits Association, inasmuch as because of its control of production, marketing, and export (now that the average local demand has been overtaken) there is a tendency to maintain prices and profits by limiting production and restricting competition in distribution by exporting annually certain quantities, and dumping the balance into local distilleries at a greatly reduced price to the growers. Consequently, the law of supply and demand as popularly understood is suspended. Prices are maintained, irrespective of whether the crops are light or heavy, and are regulated according to the supply available in other countries, from which these fruits would otherwise be obtained. Australian consumers are therefore compulsorily more interested in conditions in Asia Minor than in the Commonwealth, and their interests are not safeguarded under the tariff incidence. The Commissioners are of opinion that there is a sufficiently wide margin of profit to justify a considerable reduction in the retail price to the public. This would encourage a greatly increased consumption, and promote the extension of the industry. An improved railway service between Mildura and Melbourne would also be advantageous to the growers by assisting them to market successfully their green fruit.'

RECOMMENDATIONS.

" There are 29 recommendations put forward by the majority, as follows :— 1. That the Government contract with steamship companies for the necessary refrigerated space for fruit exports and allot the same *pro rata* according to the requirements of growers in the several States. 2. That fruitgrowers be given an opportunity to secure refrigerated space for fruit for export within a few weeks of the time of shipment. 3. That an equitable proportion of refrigerated space be secured to each State in the case of subsidized steamers. 4. That refrigerated chambers of reasonable capacity be provided for the carriage of fruit in vessels engaged in the inter-State trade. 5. That self-registering thermometers be installed in the refrigerated chambers of all oversea vessels carrying fruit cargo. 6. That cool storage facilities be established in suitable centres under Government or co-operative control. 7. That a Commonwealth-owned line of oversea steamers be established. 8. That a Commonwealth-owned line of inter-State steamers be established. 9. That more effective arrangements be secured for the safe carriage of fruit in the inter-State trade, both on deck and under hatches. 10. That a sufficient supply of louvred vans be provided on the railways of each State. 11. That all carts, wagons, and cars used in the transport of fruit be periodically inspected and disinfected. 12. Co-operative marketing of fruit. 13. That produce departments controlling exports be established in all the States. 14. That inquiry be made abroad as to the possibility of securing more effective distribution of Australian fruit in the United Kingdom and on the Continent of Europe. 15. That an inquiry be made abroad into the charges and practices of selling and distributing, agents' methods of sale, handling, storage, and display of Australian fruit. 16. That the export of inferior and diseased fruit be prohibited. 17. That to ensure uniform grading and branding, central packing sheds be established in the fruit-growing districts. 18. That all cases used in the transport of fruit be of uniform capacity, the bushel to be the standard. 19. That a Commonwealth Trade Commissioner in London be appointed. 20. That all fruit agents and traders be licensed. 21. That the operations of the Commonwealth Bank be extended to permit the establishment of a credit-foncier system to enable advances to be made to fruitgrowers, and to provide necessary financial accommodation. 22. That voluntary co-operative societies among fruitgrowers be formed to carry out grading, packing, branding, &c., through central packing sheds, and to utilise State or Commonwealth control of transport by rail or boat, cool storage, and marketing, in order to eliminate the unnecessary middleman. 23. Effective organisation of growers and employés in the fruit industry. 24. That action be taken to discover the most effective method of preserving lemons. 25. That abandoned orchards be eradicated by the authorities. 26. That the controlling authorities be given power to combat orchard pests and diseases at the expense of growers who have failed to do so after due notice. 27. That all nurseries be registered and periodically inspected. 28. That a Commonwealth Bureau of Agriculture be established. 29. That the use of trays and walking planks be made compulsory."

"RUSTY" MANGOLDS.

Recently Mr. J. Spencer, of Clarendon, brought under the notice of the Agricultural Department the tops of some of his mangolds, which appeared to have been smitten by a rust, with the result that they wilted away almost to nothing. The specimens were forwarded to the Government Vegetable Pathologist (Professor Osborn), who sent to the Minister of Agriculture (Hon. T. Pascoe) the following interesting report:—"The mangolds are infected with *Uromyces betae*, the 'beet rust,' an introduced fungus that probably came with the seed from Europe, where the disease is of less importance. Nothing can be done to cure the infected plants, though there might be a lessening of virulence as the weather becomes hotter and drier. It is desirable to burn the diseased leaves, not to allow them to rot on the ground, and also not to grow beet or mangolds on the same land for at least two years. If any of the mangolds are running to seed, I shall be glad if the grower will send to me some heads to examine."

POULTRY NOTES.

By D. F. Laurie, Government Poultry Expert and Lecturer.

POULTRY AND AGRICULTURAL BUREAUX.

I am glad to notice that many papers on poultry breeding are included in the reports of the various Bureau meetings. There are a few points which arise, and may be considered.

Apathy of Farmers.

During many years I have visited numerous farms, and have discussed poultry breeding with both farmer and his wife. As a rule, poultry are to be found on the farms in this State, and it is rarely that any complaint is made that the venture is unprofitable. While there are many farmers who take an intelligent view of the question, there are more who are apathetic. These latter seem to have a grudge against poultry that is difficult to understand. As a rule such a farmer pays little attention to housing and breeding, although he may allow his wife sufficient wheat to feed the birds. Our South Australian farmers are justly proud of their high position among the farmers of the Commonwealth. Many of them, however, have yet to appreciate the fact that stock-dealing and wheat-growing are not the only points in farming worth considering.

Poultry on every Farm.

Every farmer should have a flock of modern commercial poultry, housed properly and fed on business lines. Few farmers are to be found who will deny that poultry on a farm are very profitable. There are some who are so wealthy that a hundred or two pounds a year is not worth considering. It is good for such that they live in such a wonderfully productive land where one need not work too hard. Then, again, many who agree with the poultry proposition do not house their birds properly. Yet there are scores of level-headed and successful farmers who have for years owned model poultry plants on their farms. Many farms are badly infested with poultry ticks, and this is a question which will have to be grappled with before long. The trouble is due to faulty methods of housing, to carelessness, and general apathy.

Pure versus Crossbreds or Mongrels.

In a report in the June *Journal* I see the time-worn statement that such and such speakers considered that crossbreds (mongrels) were hardier than pure breds. Many in this State have "crossing" on the brain; it is an obsession. There is no foundation for the statement that pure-bred poultry are more delicate or prone to disease than mongrels are. Throughout the world the successful poultry breeders breed pure stock only. If it were not so no one would be fool enough to continue a bad practice. As it is no sensible man would attempt commercial poultry breeding with other than pure stock of proved strain. It is a fact, however, than many farmers are keen buyers—they look upon a fowl as a fowl, and prefer one at a cheap price. The breeder who is known for the productiveness and strong constitution of his stock has always a ready sale at a good price. The incompetent breeder can, of course, sell his delicate useless stock at a low price. It is really worthless.

TESTING HENS FOR A SECOND OR THIRD YEAR.

Mr. Stevens, of Mount Barker Bureau, urges that there should be second-year and third-year tests at Parafield. I have discussed the egg production in the second and third year of certain breeds, with Mr. Stevens and many other breeders. A second-year test with White Leghorns is not warranted, and the only result that might accrue is what any breeder can achieve, viz., the discovery of material for building up a strain that would lay well in the second year. Wyandottes and Langshans, if well bred and carefully culled, are always worth keeping for a second year, and some of the hens even for a third year. With the all-round or general-purpose breeds the profits are general, and not from eggs only. I have always advised breeders to cull their pullets. I mean where a man has a number—be it 50 or 5,000—producing market eggs. He can at the close of the first year pick out a percentage worth keeping on, perhaps for six months only. This is especially necessary in order to keep up a supply of large eggs while the pullets are improving in that respect. There is this point, however, as regards competitions—how many breeders would consent to the innovation ? This year the heavy breeds—with the exception of two pens in Section I.—are being single tested. Any owner of a good layer will naturally require her for breeding. The matter has been kept in view for some years, and probably I shall communicate with the present competitors to ascertain how many are willing to compete for a further period.

LECTURES AT THE SCHOOL OF MINES.

A course of 12 lectures began on Wednesday evening, July 1st, and will continue on each Wednesday evening at 8 o'clock. Readers in the suburban area are invited to join this class, as it will save much letter-writing, telephoning, and personal interviews. The fee is nominal, only 5s.

OPERATIONS FOR JULY.

Time flies ! Here we are in the first month of the second half of the year. In the June number I covered a good deal of ground of a general nature, and applicable to July operations. July heralds a general application to the business of incubation. Judging by the advertisements, most of the leading incubators are to be purchased in Adelaide. I am often requested to express opinions as to this and that machine. On reflection it will be admitted that I could not do so, because other makers, or agents, would feel aggrieved. After all it is the man more than the machine. With one exception, I have never had a machine to try which was not capable of satisfactory work.

INCUBATOR THERMOMETERS.

Unless the thermometer is accurate the hatch will be more or less a failure. Never buy a cheap thermometer for use in an incubator. Even the best made thermometers are liable to damage which will cause serious error. The column of mercury may be broken, and a small portion of the mercury representing several degrees may become detached and lodged up in the vacuum space at the top of the tube. All thermometers should be tested. If you cannot compare with a standard, take your own temperature and that of a few other healthy persons as a check. In health this should be 98½°. If the thermometer is correct at this reading it would be strange if it were incorrect at 101° to 103°.

STUDY THE MAKER'S DIRECTIONS.

Most makers send explicit instructions with their machines, and these should be carefully observed. Different machines require special treatment, as described by the makers. If possible, build a special incubator room which will provide fairly constant temperatures. After placing the eggs in the drawer or egg tray, mark each with a lead pencil—not an indelible—and leave in the machine for 48 hours before turning them. Test for fertility on sixth or seventh day, and again on the fifteenth for hens, and twenty-second for ducks. Do not open the machine after the first egg "chips." Do not remove from machine until chicks, ducklings, &c., are dry. Do not feed for from 24 to 40 hours after removing from the machine.

BREEDS TO KEEP.

For Market Egg Production.—White Leghorns. If you are so desirous you may build up a good laying strain of Brown Leghorns or Minorcas. A good strain, if the birds are typical, would be very profitable.

For Eggs and Meat.—Just as a Clydesdale is not used for a flat racer, nor a racehorse for sand-carting, so no one breed will give a maximum of eggs and provide the very highest type of table bird. Our modern general purpose breeds are moderate to good layers, and the chickens make moderate to good table chickens. Looking at the entries in Section 4 of the Parafield Laying Competition, one gathers a fair idea of what the leading breeders here consider the best to breed.

White Orpingtons (four pens).—A breed which is making many friends, as the hens are good winter layers of fine eggs, and the chickens are plump, and have white skin, flesh, and legs. They are large, hardy, and handsome fowls.

Black Orpingtons (six pens).—This is a well-known favorite breed—large bodied, hardy, handsome, good layers. The chickens grow quickly, and have white flesh and skin ; legs black.

Buff Orpington (one pen).—The difficulties in breeding the correct shade of buff without mealiness or dark feathers is against this bird. As a rule the hens are not good layers. The chickens are excellent, and have white skin, flesh, and legs.

Silver Wyandottes (four pens).—A beautiful and popular breed, and one that has done big things in egg-production. Generally a good layer ; sometimes the eggs are small. Chickens quick growing, plump, splendid quality. Creamy flesh and skin, yellow legs.

White Wyandottes (two pens).—This variety is coming into public favor. It is less difficult to breed than the other varieties of Wyandotte. It should be the ideal farmers' fowl. Wyandottes are medium sized.

White Plymouth Rocks (three pens).—This variety is coming into much favor, and does not need double mating, as is the case with the barred variety. Some strains are good layers of fine eggs, and the chickens are excellent, quick growing. Skin and flesh creamy-white, legs yellow. This breed won in the table section General Purposes Society March Show.

Barred Rocks.—This breed is similar to the foregoing in utility. Separate matings, however, are required for breeding standard males and females. Plymouth Rocks are large fowls.

Langshan (one pen).—This good old breed deserved better representation. The hens are good layers of the nicest brown eggs ; the chickens are excellent for table.

Indian Game.—Splendid table birds, the breast meat is phenomenal. The chicks are always plump. As layers the hens do not shine.

Rhode Island Reds.—A breed comparatively new to Australia. Hens fair layers ; chickens very hardy and easy to rear, quick growers ; quality of meat good, skin and flesh creamy, legs yellow.

Faverolles are not in the test, but the breed is one of the best. The hens are good layers, and the chickens, when well fattened, are of the very highest quality.

Old English Game.—The hens are excellent layers of standard eggs, and the chickens make small but most beautiful tablebirds of the very highest quality.

Sussex, Red, Speckled, Light.—The Reds have made some stir in Victoria, and have been bred here by one or two people. Speckleds are now to hand, and also, it is said, some Light Sussex, but I have not seen them. The Sussex is an old breed remarkable for its table qualities ; the hens are fair layers. The various sorts have yet to be proved in this State.

PARAFIELD POULTRY STATION.

EGG-LAYING COMPETITION, 1914-15.

[Started April 1st, 1914, to terminate March 31st, 1915.]

Competitor.	Eggs Laid for Month ended June 30th.	Total Eggs Laid from April 1st, 1914, to June 30th, 1914.
SECTION I.—ANY BREED.—TEN PULLETS EACH PEN.		
WHITE LEGHORNS.		
Hay, C., Prospect	80	204
Indra Poultry Farm, Freeling	199	482
Moritz Bros., Kalangadoo	186	431
Sargenfri Poultry Yards, East Payneham	139	293
Albion Poultry Yards, Magill	192	352
Conyers, H., Morphettville Park	168	436
Brackley Poultry Yards, Hectorville	185	370
Schäfer, N. H., Strathalbyn	127	231
Mason, A. E., Langhorne's Creek	171	393
Robertson, D. J., Hamley Bridge	213	571
Olive Poultry Farm, Freeling	134	357
Bradley & McDonald, Moorabbin, Victoria	194	492
Sunny Brae Poultry Farm, Islington	122	284
Winter & Creswell, Port Pirie	144	346
Kelvin Poultry Farm, Kelvin Grove, Brisbane	179	332
Abby Poultry Yards, Willaston	182	382
Broderick Bros., Gawler	174	445
Gill, J. H., Cheltenham, Victoria	181	422
Dunn, C. C., Cheltenham, Victoria	204	428
Evans, H. A., Richmond, South Australia	129	307
Ellimatta Poultry Yards, Torrensville	151	298
Pettigrove, T. A., Northcote, Victoria	135	361
Rice, J. E., Cottonville	117	322
Purvis, W., Glanville	182	524
South Yan Yean Poultry Farm, Doreen, Victoria	155	325
Purvis, W., Glanville	158	479
Pope, R. W., Heidelberg, Victoria	176	541
Provis & Son, Tumby Bay	203	387
Tockington Park Poultry Farm, Grange	103	269
Woodhead, H., Torrensville	160	490
Pimlott, A. V., Port Pirie South	121	274
Excelsior Poultry Farm, Willunga	38	65
Barron, Tom, Catforth, England	177	547
Ogilvie, G. L., Hamley Bridge	26	69
Ford Bros., Kensington Gardens	118	324
Hughes, J. A., Willunga	116	238
Broster, G., Mallala	133	328
Roberts, C. A., Kersbrook	153	297
Campbell, J. D., Barabba	174	365
Rowe, J., Long Plain	171	391
Messenger & Roberts, Albert Park	99	256
Harris, J. G., Black Forest	123	345
BLACK ORPINGTONS.		
Fisher, D., Drouin South, Victoria	176	432
WHITE WYANDOTTES.		
Barron, Tom, Catforth, England	216	560

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Score to June 30th. Bird No. 1.	2.	3.	4.	5.	6.
SECTION III.—SINGLE TESTING.—LIGHT BREEDS.—SIX PULLETS EACH PEN.						
WHITE LEGHORNS.						
Hay, C., Prospect	62	46	13	5	26	38
Harris, J. G., Black Forest	19	52	28	—	6	14
Glenelg River Poultry Farm, Mount Gambier	46	28	53	57	43	42
Schafer, N. H., Strathalbyn	—	30	16	4	21	1
Eckermann, W. P., Eudunda	46	48	24	26	52	22
Hagger, J. C., Orroroo	—	47	28	37	16	11
Glenelg River Poultry Farm, Mount Gambier	3	42	3	22	15	23
Koonoowarra, Enfield	38	23	24	10	41	29
Moritz Bros., Kalangadoo	48	44	54	47	40	31
Sargenfri Poultry Yards, East Payneham	4	—	1	1	43	16
Albion Poultry Yards, Magill	44	34	10	27	43	40
Glenelg River Poultry Farm, Mount Gambier	39	18	39	33	20	51
Conyers, H., Morphettville Park	36	55	37	41	56	8
Bea[illegible]nall Bros., Gawler	34	41	20	41	38	59
Schafer, N. H., Strathalbyn	35	44	28	42	22	31
Robertson, D. J., Hamley Bridge	26	47	45	59	39	46
Russell, E. L., Salisbury	39	42	40	32	17	28
Bennett & Furze, Wright Street, City	12	31	24	—	20	20
Flannigan, J., Maylands	35	0	46	46	23	35
M[illegible]els, C. & H., Littlehampton	29	55	23	55	43	18
Sunny Brae Poultry Farm, Islington	49	35	28	32	35	43
Dunn, L. F., Keswick	59	31	56	31	33	40
Electricum Poultry Yards, Glenelg	55	54	47	42	31	31
Barkla, L. W., Gawler South	21	25	14	28	41	7
Purvis, W., Glanville	43	45	30	62	56	38
Harvey, A., Hamley Bridge	50	45	35	39	42	33
Brock, A. G., Hamley Bridge	6	42	19	25	40	50
Leonard, W. J., Port Pirie	23	18	12	32	33	1
Bertelsmeier, C. B., Clare	36	32	44	51	38	43
Messenger, A. J., Alberton	36	29	3	24	29	31
Bond, A. J., Clare	42	47	31	41	48	45
SECTION IV.—SINGLE TESTING.—GENERAL PURPOSE BREEDS.—SIX PULLETS EACH PEN.						
WHITE ORPINGTONS.						
Koonoowarra, Enfield	27	24	30	25	45	—
Hocart, F. W., Clarence Park	—	—	—	—	—	—
Dawkins, W., Wayville	—	7	16	1	18	—
Perkins, C. W., Kensington Park	32	15	—	7	—	29
BLACK ORPINGTONS.						
Padman, J. E., Plympton	8	5	16	16	42	14
Kappler Bros., Marion	51	35	14	26	—	13
Haggar, J. C., Orroroo	—	39	—	14	3	—
Pope Bros. & Co., Hectorville	6	19	4	15	—	—
Greaves, W. E., Prospect	23	5	—	26	5	25
Pearson, W. S., Kingswood	24	5	10	5	25	14
BUFF ORPINGTONS.						
Bennett, C. E., North Unley	—	22	22	24	—	—

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Score to June 30th. Bird No.					
	1.	2.	3.	4.	5.	6.
SECTION IV.—*Continued.*						
SILVER WYANDOTTES.						
Howie, T. B., Edwardstown	28	—	17	1	19	48
Kappler Bros., Marion	2	9	4	2	28	34
Dunn, L. F., Keswick	25	44	11	3	4	28
Perkins, C. W., Kensington Park	—	—	—	—	20	—
WHITE WYANDOTTES.						
Albion Poultry Yards, Magill	7	—	—	—	—	—
Gibson, F., Stepney	1	—	—	—	—	—
WHITE ROCKS.						
Padman, J. E., Plympton	—	—	31	5	7	38
Alberta Poultry Yards, Franklin	4	—	—	—	—	—
Koonoowarra, Enfield	14	29	6	—	1	—
PLYMOUTH ROCKS.						
Hagger, J. C., Orroroo	12	17	—	18	31	—
Greaves, W. E., Prospect	19	21	9	3	4	—
LANGSHANS.						
Palmer, W., Goodwood Park	4	8	25	—	33	—
INDIAN GAME.						
Coleman, C. B., Alberton	—	—	—	—	—	—
RHODE ISLAND REDS.						
Koonoowarra, Enfield	—	1	—	7	—	—

D. F. LAURIE, Poultry Expert and Lecturer.

PARAFIELD EGG-LAYING COMPETITION.

REPORT FOR JUNE.

Health.—The general health of the birds has been good. Birds which were previously recorded as sick have either recovered or have been replaced. In Section 1—Open Class—one bird in pen 38 was removed owing to leg weakness. In pen 27 a hen died from malignant growths at base of the tail. In Section 3, Single Test, Light Breeds, the health of the birds is normal. In Section 4, Single Test, General Purpose Breeds, hen No. $\genfrac{}{}{0pt}{}{6}{7}$ was suffering from leg weakness, and was treated. One bird died, No. $\genfrac{}{}{0pt}{}{8}{5}$, evidently through choking at feeding time, as she otherwise appeared healthy.

Moulting.—This year the moult has been a long and slow process. But although the birds are looking fit, there seems to be some condition which reacts. In former years as soon as the new feathers grew the laying rapidly increased ; but it is not so this year. From all quarters reports from breeders have been received telling of similar conditions. There is no doubt the unseasonable weather does not suit the fowls.

The weather has been spring-like, with five frosty mornings. Rain, very light, was recorded on five occasions—only 34 points for the month, or 2·50in. below the average. The warm days and cold nights are not conducive to the best results.

Egg Production.—There has been fair all-round improvement ; the total eggs laid has increased by about 2,000 eggs more than were laid during May.

Broodiness.—There were three cases recorded in pen 51, and one in pen 50, Section 1.

Greenfood is abundant, and the birds have ample supplies in variety, principally lucerne and barley.

Visitors.—Seventy-eight persons visited the Poultry Station during the month—total to date 1,176.

D. F. Laurie, Poultry Expert.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, June 10th, there being present Messrs. G. R. Laffer, M.P. (Chairman), A. M. Dawkins, F. Coleman, C. E. Birks, J. Miller, G. Jeffrey, C. J. Valentine, Col. Rowell, and G. G. Nicholls (Secretary).

Combined Drill and Cultivator.—A reply was received from the Secretary of the Royal Agricultural Society as follows, in response to an inquiry regarding the wisdom of adopting a suggestion made by the Willowie Branch, that steps should be taken to induce the Government to encourage the manufacturing of a combined cultivator and seed drill, by offering prizes at the Royal Agricultural Society's shows, and by other means :—" Although such a combined implement has been on the market for a considerable number of years, the fact that there has been little demand for it shows that it does not commend itself to farmers generally. The function of the society is largely educational, and it is felt that such a method of seeding as by a combined cultivator and drill should not receive encouragement, as by the use of such an implement neither operation could be efficiently performed."

Forestry Lectures.—Respecting a suggestion made at the preceding meeting that arrangements might be made for the Lecturer in Forestry to give addresses before the Branches of the Bureau, the Secretary to the Minister of Agriculture wrote that the Commissioner of Crown Lands advised that the instructor had very little time for public lecturing, owing to University duties, and he questioned whether it was wise to call upon him or upon the Conservator, except possibly when a general congress was being held. The Minister was generally in accord with this view, and would endeavor to arrange for forestry matters to be dealt with at some of the annual conferences.

Branding of Manure Bags.—Mr. Coleman said that for years the bags containing superphosphate were branded distinctly, but during the last 12 months more than one firm had been sending out fertilizers in bags which carried merely a label or tag indicating the character of the contents. That was highly undesirable, because the unmarked bags were almost certain to be utilised for other purposes, including the conveyance and storage of wheat. The Fertilizers Act merely required that certain particulars should be " durably affixed to every sack." That should be struck out, and it should be made obligatory upon those who sold or offered manure for sale to brand the bags themselves. With a view to that end, he proposed that the matter should be brought under the notice of the Minister of Agriculture, and added that he had heard that the farmers were "rushing the super. distributed in the unmarked bags in order to get the sacks cheaply." Mr. Jeffrey seconded the proposition, which was agreed to.

Postal Carriage of Fruit.—With reference to a request received some time ago from the Longwood Branch in relation to the facilities for the conveyance of fruit through the post, the Secretary reported that he had written to the Deputy Postmaster-General, who had replied to the effect that "parcels of fruit, cut flowers, vegetables, and eggs are accepted for transmission through and to all parcel post offices in Australia, the limit of weight being 11lbs. where the service is by railway, coach, or steamboat, and 3lbs. where other means of conveyance are employed. The articles mentioned must be specially marked 'fragile' or 'perishable' as the case may be. No arrangement similar to the New Zealand 'Order coupon for the supply of fruit' is at present in existence in any of the States, but on July 1st, 1914, it is intended to initiate in Victoria a scheme by which agricultural produce will be carried at reduced rates by the Railways Commissioner and delivered in Melbourne by the Postal Department."

The Fruit Industry.—Mr. Birks desired to be informed whether there was any justification for a feeling of pessimism regarding the prospects for the currant and fresh fruit industry. The Chairman (a large fruitgrower) pointed out that, although the latest apple crop locally had suffered through the lack of moisture, it was noteworthy that during the last couple of seasons good fruit had brought higher prices than probably ever before. Personally he saw no reason for alarm or despondency, and emphasized the fact that new world markets were constantly being opened up, and what in the fruit line was once regarded as a luxury was now being looked upon as a necessity, all of which augured well for an increasing demand for fruit. Growers, however, must realise that it was essential properly to grade their fruit, and place it on the market in uniform lots, by which means only could they hope to absolutely win the confidence of the buyers. The Tasmanian orchardists were in no way pessimistic, a fact which was eloquently proved by the large areas they were putting under trees every year.

Indian "Gram."—A fodder known as gram was brought under the notice of the Board by the Secretary, who explained that, having seen references to it by Capt. H. Parsons (Secretary of the Inman Valley Branch of the Bureau), he had written to that gentleman and obtained the seeds and dried plants produced. These members inspected with much interest. The following report on the fodder had been courteously prepared and furnished by the Government Veterinary Lecturer (Mr. F. E. Place), who had spent many years in India :—" Gram (*Cicer arictinum*) is a legume, practically a pea bearing two seeds in a pod. The plant is deep rooting, bushy, and spreading, with purple flowers, and reddish-brown or yellowish seed. It is extensively grown in

India, where it is the chief fodder and grain for horses. It attracted the notice of Capt. Parsons, when he was at Sialkete on duty with the 17th Lancers, and he brought a few seeds home and grew them at Inman Valley. The sample of seed was of decidedly poor quality. In the parts of India where the temperature and rainfall approximate to the conditions in the north of this State, gram usually follows a green crop such as mustard, and is sown after the rains in September, and ripens for harvest in April and May. The South Australian conditions would probably be—seeding in July and August, and harvesting in December or January. The Indian system is too crude for adoption in South Australia, where the crop would be treated, as regards tillage and seeding, in the same way as peas. A 10-bush. crop is good in India, but Capt. Parsons estimates, from his own experience, that quite double that yield would be obtained under favorable conditions in South Australia. The accompanying analysis of the gram shows that it has a very high feeding value, being rich in fat, which food component is notably lacking in South Australian fodders, and the presence of which is so necessary to ward off paralysis, dry bible, and diseases of similar character. When gram is described as a badly-balanced food the condemnation is rather in its favor, because of its high nitrogen content. The feeding ratio, however, may be easily balanced by giving hay with it, or, if used as a green fodder, adopting the Indian plan of growing a mixed crop of gram and barley, wheat, or oats. No doubt the custom of mixing the crop facilitates harvesting by keeping the plant upright. The percentage composition of gram is—Water, 10·86 ; proteids, 21·17 ; fat, 4·47 ; carbohydrates, 69·11 ; salts, 3·39. A draught horse would do well on 8·10lbs. of gram, and 20lbs. to 25lbs. hay daily. Capt. Parsons has favored me with the following notes :—' Land prepared as for peas, the best results would be from land that had been fallowed the spring or summer before. Soil—light loam or sandy soil gave best results with the little experimented with. While in India I noticed that where gram was planted alone, it grew in loamy or sandy soils better than on heavy land. Of course this may have been on account of the crude mode of ploughing in India, with a wooden plough to a depth of only 2in. or 3in., and as the plant is a deep rooter, it has a better chance of rooting in light soil. Land for cultivation must be kept free from weeds. Drill in as for peas about 2bush. per acre, and use about 80lbs. guano super. What I experimented with I drilled in by hand, with a little fowl manure from the poultry house. For feeding off as a growing crop I would advocate planting mixed either with barley, rye, or oats. If planted early it runs over the ground, and does not stand up until about to blossom. Therefore, a mixture of barley or rye would keep it up, as with vetches. But for grain I would advocate planting in August in a district like Inman Valley. Last year I planted gram in September, and it was in blossom the same time as some planted on March 20th. Gram of quick growth is most palatable to stock ; in fact, when in blossom, it is like lucerne, much harder to digest and less attractive.'" The Board decided to send the report to the Hon. the Minister.

Branches.—The Secretary reported that the Branch at Friedrichswalde had been closed. Approval to a new Branch at Carrow was given, with the following gentlemen as members :—Messrs. W. J. M. Cowley, T. Burt, J. E. Matthews, C. Storrie, F. Beare, jun., T. Beare, sen., H. A. Freeman, J. McBride, W. Umhauff, W. D. Chalmers, L. F. Byrne, H. Lovelock, F. J. Anear, B. Gobelt, sen., G. M. Begg.

New Members.—Monarto South—A. Bormann ; Wilkawatt—A. B. Neville ; Crystal Brook—J. R. R. Cornish, J. Forgan, R. F. Harding, H. C. Heath, A. G. Head, S. H. Marshall ; Clare—C. H. Cichon ; Roberts and Verran—A. J. Drayton ; Utera Plains—F. H. Hill ; MacGillivray—J. G. Johnston ; North Bundaleer—J. P. Maloney, C. Pearce ; Mount Remarkable—T. Willington ; Two Wells—J. R. Lawrie, C. E. Oke, J. Frost, H. T. Judd ; Longwood—E. W. Beythein ; Port Broughton—Rev. P. C. W. Eckersley ; Borrika—C. W. Jones, H. Griffiths, G. W. Jacobs, W. Tonkin, sen., W. F. Tonkin ; Pinnaroo—E. A. Warren ; Clanfield—C. T. Sale, A. Clutterbuck, A. E. Baker ; Morphett Vale—W. Taylor ; Mount Gambier—J. Davidson ; Pine Forest—G. Inkster ; Yongala Vale—A. R. M. Nancarrow ; Penong—C. Pearson ; Mount Barker—T. C. Paltridge, E. Ellis ; Appila Yarrowie—F. Thwaites, R. Francis ; Inman Valley—M. C. Millard, L. M. Allert ; Orroroo—H. S. Bennett, J. Aspinall, W. C. Brook, H. P. Joyce, E. Forrester ; Uraidla and Summertown—J. M. Bonython, C. Oliver ; Geranium—W. A. Stacey, C. A. Grieg, R. Perrin ; Booleroo Centre—F. D. Brooks ; Laura—H. H. Hammill, R. Rose, J. J. Lowe, H. R. Lines, E. Peck ; Blyth—P. Henschke, E. Scholz ; Mantung—A. E. Solly, D. Stewart ; Mount Compass—M. Jacobs, W. Wright, D. D. Hancock ; D. J. McEwan ; Belalie North—A. V. Crouch, W. H. Axford ; Narrung—W. Laurie, A. Creed ; Mallala—H. B. Moody, jun., L. C. Franks ; Wepowie—J. Chrystall ; Bute—G. Hood, J. Shanks ; Halidon—W. R. Burnard, D. S. Freeland, A. Henningson, C. Henningson, E. H. F. Muecke, C. H. Russell, C. A. Russell, J. Westover ; Mount Compass—O. T. Trevena, A. W. Trevena, W. C. Trevena, A. Peters, H. Peters, S. Peters, C. Neighbor, W. Neighbor, L. Neighbor.

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THE WHEAT MARKET.

Commenting on the wheat position *Beerbohm's Corn Trade List* under date London, June 5th, states :—" Much may happen to the crops during the next two or three months, but there are already indications that, on the one hand, the requirements of importing countries will be larger than in any previous year, and, on the other hand, that, with ordinary climatic conditions in the future, exporting countries will be in a position to ship more wheat than ever before. Apart from Italy and France together probably needing more wheat than in the present season, Austria-Hungary, which usually grows sufficient wheat for its own consumption, is expected to be a very large importer. The crop in Hungary promises to give such a very poor yield that the minimum requirements of foreign wheat are put at 5,000,000 quarters, while some of the estimates are for a much larger quantity. In all probability by far the larger proportion of any surplus that Roumania may have to spare will be taken by Hungary, and only a comparatively small quantity will be available for other European countries. If Russia has an average crop this year (present prospects are favorable), that country will have a large surplus for export, as, in view of the continued large exports for the time of year, it would appear pretty certain that there are still large reserves left over from the last crop. With America almost certain to be a larger exporter than ever before, it would, however, still require moderate shipments from the Argentine, Australia, and India, and a large export from Canada. to satisfy the requirements of importing countries in the coming season. There have been a good many complaints from time to time as to the poor quality of much of last year's wheat, this being given as the reason why the quantity of foreign wheat required has been larger than estimated early in the season. It is quite possible that this year's wheat will be of better quality, and import requirements modified to some extent.

" Meanwhile it does not appear at all probable that supplies of wheat in the last two months of the present season will be in any way excessive. At the same time, if ordinary climatic conditions obtain during this month and next, and the European wheat crops be harvested at the usual time, consumers will most likely confine their purchases to the satisfying of actual requirements, unless there should even now be some serious mishap to the American crop."

THE WORLD'S VISIBLE WHEAT SUPPLY ON JUNE 1.

	European. Qrs.	U.S.-Canada. Qrs.	Total. Qrs.	Eng. Average. Price.
1914......	8,700,000	7,515,000	16,215,000	33/9
1913......	9,975,000	8,440,000	18,415,000	32/7
1912......	10,885,000	8,315,000	19,200,000	36/10
1911......	11,180,000	5,550,000	16,730,000	32/5
1910......	10,100,000	4,625,000	14,725,000	31/3
1909......	7,300,000	4,000,000	11,300,000	42/6
1908......	8,040,000	3,800,000	11,810,000	33/5
1907......	9,120,000	9,175,000	18,295,000	31/4
1906......	9,210,000	5,450,000	14,670,000	30/4
1905......	9,135,000	3,750,000	12,885,000	31/-
1904......	9,810,000	4,000,000	13,810,000	26/9
1903......	6,875,000	4,825,000	11,700,000	27/8
1902......	8,260,000	5,100,000	13,360,000	30/3
1901......	8,520,000	6,475,000	14,995,000	27/7
1900......	8,160,000	8,060,000	16,220,000	25/5
1899......	7,950,000	5,700,000	13,650,000	25/2
1898......	7,900,000	3,850,000	11,750,000	47/9

Date.		LONDON (Previous Day). Per Bushel.	ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
June	8	—	3/10	3/10¼	3/10¼
	9	—	Do.	Do.	Do.
	10	Steady, but quiet	Do.	Do.	Do.
	11	Dull, easier tendency	Do.	Do.	Do.
	12	Quiet ; Liverpool, very dull, lower to sell	Do.	Do.	Do.
	13	Quiet	Do.	3/10¼ to 3/10½	3/10¼ to 3/10½
	15	—	Do.	3/10½	3/10½
	16	Quiet ; Liverpool, steadily held, not active	Do.	Do.	Do.
	17	Quiet ; Liverpool very dull, lower to sell	Do.	3/10¼	3/10¼
	18	Quiet	Do.	Do.	Do.
	19	Quiet ; Australian arrived, 4/6¾ ; Liverpool dull, neglected	Do.	Do.	Do.
	20	Quiet	Do.	3/10 to 3/10¼	3/10 to 3/10¼
	22	—	Do.	Do.	Do.
	23	Quiet ; Liverpool dull, lower to sell	Do.	3/10	3/10
	24	Dull and neglected	Do.	Do.	Do.
	25	Very weak, 3d. to 6d. lower	3/9 to 3/9½	Do.	Do.
	26	Steadier, not active ; Liverpool quiet	Do.	Do.	Do.
	27	Quiet	Do.	Do.	Do.
	29	—	3/9	3/9¾ to 3/10	3/9¾ to 3/10
	30	Quiet ; Liverpool steadily held, not active	Do.	Do.	Do.
July	1	Quiet	Do.	3/9¾	3/9¾
	2	Very dull and lower to sell	Do.	3/9¾ to 3/10	Do.
	3	Steadier tone, not active ; Liverpool steadily held, not active	Do.	Do.	Do.
	4	Firmer, but quiet ; Liverpool firmer, more inquiry	Do.	Do.	3/9½ to 3/10

Steamer Freights.—(July 1st)—Steamers from South Australia to United Kingdom-Continent, full cargo rates, 17s. 6d. per ton (5⅝d. per bushel) ; to South Africa, 17s. 6d. per ton (5⅝d. per bushel). Parcels, Port Adelaide to London-Liverpool, or Continent, 20s. per ton (6⅜d. per bushel) ; Port Adelaide to Melbourne, 12s. per ton (3⅞d. per bushel) ; to Sydney, 14s. 6d. per ton (4⅝d. per bushel).

Sailer Freights.—From South Australia to United Kingdom-Continent, 20s. per ton (6⅜d. per bushel) ; South Africa, 17s. 6d. per ton (5⅝d. per bushel).

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on July 1st—

Butter.—The local increase has been very light, and importations continue from the eastern States to fill up the shortage. Values all round have improved to the extent of a penny per pound, prices being ruled from outside markets. "Alfa" is selling at 1s. 4d.; "Primus," 1s. 3d.; choice separators and dairies, 1s. 1d. to 1s. 2d.; store and collectors', 11d. to 11¾d. per pound.

Eggs.—The mild weather has brought along larger quantities, and quite a record drop has been established, chiefly owing to Western Australia being self-supplying. The easing during the month was 9d. per dozen. A cold snap of weather would, however, cut off supplies and the market would improve. Hen eggs, 10½d. per dozen; duck, 11d.

Cheese is meeting with a very good turnover, no doubt the high prices ruling for fresh meat causing a heavier consumption in this line. Present quotations are from 8¼d. to 8¾d. per pound for large to loaf.

Honey.—The inquiry has been much better this month, purchasers operating with more freedom. Prime clear extracted is selling at 3d. per round; beeswax, 1s. 3d. per pound.

Almonds.—Competition has been very keen, and all parcels readily taken up, both for local and export. Brandis, 7½d.; mixed softshells, 6½d.; hardshells, 3½d.; kernels, 1s. 5d. per pound.

Bacon.—Prices are unaltered, and although local supplies have increased they are not sufficient to fill the demand, and importations have been necessary. Best factory-cured sides are selling at 9½d. to 10½d.; hams, 9d. to 11d.; lard in skins, 8d.; bulk, 7d. per pound.

Live Poultry.—Good rates continue to rule for all classes, and although the catalogues have shown a marked increase the demand has been quite equal to it, and good clearances have been effected. Heavy weight table roosters, 2s. 9d. to 3s. 3d. each; nice conditioned cockerels, 2s. to 2s. 6d.; hens, 1s. 6d. to 2s. (light sorts lower); ducks, 2s. to 2s. 9d.; geese 3s. 9d. to 4s. 9d.; pigeons, 5¼d. to 6d.; turkeys, from 7d. to 9d. per pound live weight for fair to good table birds.

Potatoes and Onions.—Potatoes have arrived freely from the Mount Gambier and Millicent districts, and a fair quantity has also come to hand from Victorian centres, the result being prices have eased a little. Onions—Local supplies have nearly cut out, and the consequent additional draw on the South-East crops has resulted in decidedly better rates. Present quotations—Potatoes, £4 7s. 6d. to £5 per ton of 2,240lbs. on trucks Mile End or Port Adelaide; 5s. to 7s. per cwt. in the market. Onions—£7 10s. per ton of 2,240lbs. on trucks Mile End or Port Adelaide; 8s. 6d. to 9s. per cwt. in the market.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall for the month of and to the end of June, 1914, also the average precipitation to the end of June, and the average annual rainfall.

Station.	For June, 1914.	To end June, 1914.	Av'ge. to end June.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.				
Oodnadatta	0·18	3·28	2·92	4·76
Tarcoola	0·11	1·18	3·60	7·58
Hergott	0·09	4·39	3·43	6·04
Farina	0·04	2·81	3·86	6·70
Leigh's Creek	0·29	2·60	4·95	8·66
Beltana	0·32	2·25	5·12	9·22
Blinman	0·72	2·83	7·02	12·85
Hookina	0·50	1·48	—	—
Hawker	0·51	2·33	6·03	12·22
Wilson	0·48	1·60	5·98	11·78
Gordon	0·49	1·84	5·06	10·26
Quorn	0·33	1·93	6·50	13·78
Port Augusta	0·76	3·12	4·90	9·46
Port Augusta W.	0·90	2·90	4·58	9·36
Bruce	0·23	2·03	4·85	10·01
Hammond	0·36	2·17	5·49	11·46
Wilmington	0·71	3·00	8·57	18·26
Willowie	0·21	2·70	5·69	11·90
Melrose	0·51	3·30	11·01	23·04
Booleroo Centre	0·12	2·69	7·34	15·83
Port Germein	0·20	2·52	6·10	12·84
Wirrabara	0·31	4·54	8·79	18·91
Appila	0·09	2·44	7·01	15·08
Cradock	0·36	1·49	5·44	10·86
Carrieton	0·27	1·76	5·76	12·22
Johnburg	0·09	2·10	4·74	10·21
Eurelia	0·30	1·81	6·19	13·24
Orroroo	0·23	2·55	6·58	13·42
Black Rock	0·10	2·59	5·94	12·25
Petersburg	0·13	3·97	6·11	13·07
Yongala	0·15	3·51	6·28	13·94
NORTH-EAST.				
Ucolta	0·15	1·89	—	—
Nackara	0·23	2·10	—	—
Yunta	0·31	2·28	4·34	8·22
Waukaringa	0·11	2·41	4·15	7·94
Mannahill	—	2·20	4·34	8·46
Cockburn	0·10	1·92	4·45	7·97
Broken Hill, NSW	0·88	1·82	5·08	9·63
LOWER NORTH.				
Port Pirie	0·14	2·63	7·65	13·21
Port Broughton	0·39	4·03	7·12	14·33
Bute	0·53	4·57	7·41	15·42
Laura	0·41	3·09	8·27	18·22
Caltowie	0·18	2·22	7·70	17·27
Jamestown	0·28	2·91	7·65	17·46
Gladstone	0·39	2·50	7·22	16·00
Crystal Brook	0·54	3·83	7·34	15·62
Georgetown	0·50	3·11	8·51	18·32
Narridy	0·51	3·04	6·88	16·79
Redhill	0·43	3·85	8·96	16·79
Spalding	0·64	3·55	8·77	20·25
LOWER NORTH—*continued.*				
Gulnare	0·55	3·21	8·47	19·74
Bundaleer W. Wks.	0·60	2·92	7·35	17·29
Yacka	0·62	2·64	7·07	15·27
Koolunga	0·66	3·37	7·45	15·94
Snowtown	0·57	3·68	7·48	15·70
Brinkworth	0·70	3·64	7·20	15·48
Blyth	0·53	2·83	7·77	16·34
Clare	0·79	5·55	11·11	24·30
Mintaro Central	0·67	4·08	9·78	21·99
Watervale	0·79	5·76	12·51	27·17
Auburn	0·82	4·73	11·09	24·25
Hoyleton	0·59	3·30	8·49	17·96
Balaklava	0·66	3·99	7·70	16·03
Port Wakefield	0·58	1·22	6·84	13·13
Terowie	0·10	2·34	6·13	13·71
Yarcowie	0·11	3·15	6·33	13·91
Hallett	0·19	3·15	7·16	16·40
Mount Bryan	0·41	2·72	6·90	15·73
Burra	0·38	3·25	8·11	17·82
Farrell's Flat	0·69	3·91	8·70	18·87
WEST OF MURRAY RANGE.				
Manoora	0·60	4·58	8·23	18·09
Saddleworth	0·66	4·81	9·20	19·69
Marrabel	0·47	5·61	8·66	18·94
Riverton	0·57	5·65	9·48	20·48
Tarlee	0·69	6·00	8·11	17·48
Stockport	0·60	5·51	7·28	15·89
Hamley Bridge	0·69	4·86	7·77	16·45
Kapunda	0·49	6·96	9·02	19·67
Freeling	0·47	4·25	8·14	17·85
Greenock	0·57	6·24	9·56	21·46
Truro	0·43	5·82	8·77	19·74
Stockwell	0·48	5·40	9·04	20·30
Nuriootpa	0·43	5·61	9·47	21·25
Angaston	0·57	6·41	9·87	22·25
Tanunda	0·81	8·28	10·26	22·28
Lyndoch	0·45	7·34	10·45	23·01
ADELAIDE PLAINS.				
Mallala	0·63	4·44	8·10	16·88
Roseworthy	0·46	4·80	8·12	17·31
Gawler	0·35	6·98	9·08	19·21
Two Wells	0·36	5·57	8·05	16·36
Virginia	0·22	5·10	8·52	17·58
Smithfield	0·31	5·49	8·31	17·30
Salisbury	0·32	5·96	9·05	18·57
North Adelaide	0·83	7·40	10·28	21·49
Adelaide	0·65	6·27	10·10	21·04
Brighton	0·49	4·66	9·85	19·93
Glenelg	0·46	4·70	9·09	18·35
Magill	0·75	7·87	12·65	25·69
Glen Osmond	0·80	7·06	12·03	25·20
Mitcham	1·03	7·24	11·35	23·47
Belair	0·85	6·72	14·08	28·64

RAINFALL—*continued.*

Station.	For June, 1914.	To end June, 1914.	Av'ge. to end June.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.				
Houghton	—	—	—	—
Teatree Gully	0·82	8·80	13·90	28·19
Stirling West	1·19	13·66	21·89	46·70
Uraidla	1·15	12·42	20·89	44·35
Clarendon	0·85	8·99	15·95	33·67
Morphett Vale	0·57	7·01	11·15	23·32
Noarlunga	0·95	5·96	9·76	20·28
Willunga	0·66	7·14	12·21	25·98
Aldinga	0·56	6·22	9·78	20·34
Normanville	0·71	8·31	9·91	20·65
Yankalilla	0·72	8·48	11·46	22·78
Cape Jervis	0·41	6·52	7·80	16·34
Mount Pleasant	0·64	8·91	12·25	26·87
Blumberg	0·62	10·75	13·57	29·38
Gumeracha	0·61	11·39	15·24	33·30
Lobethal	1·10	11·21	16·08	35·38
Woodside	0·85	9·93	14·23	31·87
Hahndorf	0·73	9·59	15·90	35·45
Nairne	0·72	8·72	13·24	28·83
Mount Barker	1·04	10·13	13·85	30·93
Echunga	0·87	11·27	15·44	32·83
Macclesfield	0·84	10·35	13·56	30·72
Meadows	1·22	12·51	16·33	35·52
Strathalbyn	0·62	6·37	8·89	19·28
MURRAY FLATS AND VALLEY.				
Wellington	0·36	4·91	7·17	15·01
Milang	0·60	3·91	7·86	16·08
Langhorne's Bdge	0·59	5·31	7·04	15·27
Tailem Bend	0·38	4·83	—	—
Murray Bridge	0·29	3·62	6·81	14·32
Callington	0·33	4·76	7·40	15·65
Mannum	0·43	4·16	5·84	11·67
Palmer	0·44	4·46	6·88	15·60
Sedan	0·48	4·14	5·75	11·92
Blanchetown	0·21	1·81	5·31	10·71
Eudunda	0·50	4·56	7·90	17·33
Sutherlands	0·34	3·61	4·88	10·60
Morgan	0·33	2·24	4·38	9·29
Overland Corner	0·08	3·43	5·51	11·42
Renmark	0·01	2·71	5·99	10·93
Loxton	0·31	2·21	—	—
WEST OF SPENCER'S GULF.				
Eucla	0·69	2·32	5·74	10·13
White Well	0·62	1·74	4·65	9·67
Fowler's Bay	0·65	2·25	6·38	12·11
Penong	0·52	3·12	5·94	11·93
Murat Bay	0·62	2·31	—	—
Smoky Bay	0·69	3·82	—	—
Streaky Bay	0·86	4·73	7·60	15·31
Port Elliston	—	4·93	7·94	16·49
WEST OF SPENCER'S GULF—*continued.*				
Port Lincoln	0·72	6·11	9·37	19·88
Tumby	0·19	5·51	6·98	15·00
Carrow	0·34	4·72	—	—
Cowell	0·84	4·49	5·97	11·76
Point Lowly	—	1·37	5·87	12·21
YORKE'S PENINSULA.				
Wallaroo	1·05	6·71	7·24	14·05
Kadina	0·67	5·04	7·92	15·88
Moonta	1·20	8·13	7·80	15·22
Green's Plains	0·77	4·47	7·60	15·73
Maitland	0·46	6·81	9·69	20·08
Ardrossan	0·13	1·10	6·78	13·89
Port Victoria	0·46	5·06	7·62	15·20
Curramulka	0·52	8·43	8·56	18·51
Minlaton	0·50	7·66	8·26	17·41
Stansbury	0·56	5·76	8·02	17·06
Warooka	0·60	7·37	8·16	17·71
Yorketown	0·50	6·02	8·12	17·47
Edithburgh	0·32	6·19	7·98	16·48
SOUTH AND SOUTH-EAST.				
Cape Borda	1·52	10·39	12·23	25·09
Kingscote	0·81	6·96	8·94	18·95
Penneshaw	0·96	8·15	10·14	21·34
Cape Willoughby	0·82	6·17	9·00	19·69
Victor Harbor	0·56	5·73	10·51	22·18
Port Elliot	0·56	5·51	9·60	20·33
Goolwa	0·73	6·09	8·49	17·93
Pinnaroo	0·58	3·34	7·64	16·74
Parilla	0·95	5·07	—	—
Lameroo	0·68	4·57	7·39	16·55
Parrakie	0·45	3·44	—	—
Geranium	0·47	4·30	—	—
Peake	0·46	5·14	—	—
Cooke's Plains	0·40	4·64	6·77	14·74
Meningie	0·88	5·52	8·81	18·87
Coonalpyn	0·45	6·40	7·92	17·49
Tintinara	0·61	6·21	8·65	18·78
Keith	0·52	7·35	—	—
Bordertown	0·37	4·79	8·83	19·76
Wolseley	0·43	6·28	8·03	17·72
Frances	0·27	5·72	8·85	20·74
Naracoorte	0·96	7·53	10·11	22·60
Penola	0·90	6·37	11·97	26·78
Lucindale	0·97	6·67	10·49	23·32
Kingston	1·40	9·39	11·74	24·73
Robe	1·82	9·55	11·49	24·69
Beachport	2·21	10·08	13·20	27·51
Millicent	1·64	11·46	13·86	29·25
Mount Gambier	1·71	8·81	14·30	32·00
C. Nrthumberland	1·76	10·73	12·26	26·62

AGRICULTURAL BUREAU REPORTS.

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Branch.	Report on Page	Dates of Meetings.	
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Amyton	1311	—	—
Angaston	*	4	1
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Arden Vale & Wyacca	1312	—	—
Arthurton	*	—	—
Balaklava	1318	—	—
Beaufort	1314	2	—
Beetaloo Valley	1318	—	—
Belalie North	1314	4	1
Berri	1328	11	8
Blackwood	1334	13	10
Blyth	1318	4	1
Booleroo Centre	*	3	7
Borrika	1328	—	—
Bowhill	*	—	—
Burra	*	3	7
Bute	†	—	—
Butler	1327	—	—
Caltowie	*	4	1
Canowie Belt	1315	—	—
Carrieton	*	2	6
Carrow	*	—	—
Cherry Gardens	1335	7	4
Clanfield	*	—	—
Clare	‡	3	7
Clarendon	*	6	3
Claypan Bore	1329	6	3
Colton	*	4	1
Coomandook	*	—	—
Coomooroo	*	—	—
Coonalpyn	1329	—	—
Coonawarra	*	—	—
Coorabie	1324	—	—
Cradock	*	—	—
Crystal Brook	*	—	—
Davenport	*	—	—
Dawson	*	—	—
Dingabledinga	*	10	14
Dowlingville	*	—	—
Elbow Hill	1324	—	—
Forest Range	*	2	6
Forster	1330	4	8
Frances	*	3	7
Freeling	*	—	—
Gawler River	‡	—	—
Georgetown	*	4	1
Geranium	*	25	29
Gladstone	1315	—	—
Glencoe	*	—	—
Goode	1324	—	—
Greenock	*	—	—
Green Patch	*	6	3
Gumeracha	*	7	4
Halidon	‡	—	—
Hartley	1335	8	5
Hawker	*	6	3
Hookina	*	7	4
Inman Valley	*	—	—
Ironbank	†	3	7
Julia	1319	—	—
Kadina	*	7	4
Kalangadoo	*	11	8
Kanmantoo	1336	4	1
Keith	‡	4	1
Kingscote	*	7	4
Koppio	1324	9	6
Kybybolite	‡	2	6
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Laura	*	3	7
Leighton	1316	—	—
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Loxton	†	—	—
Lucindale	*	11	8
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MacGillivray	*	—	—
Maitland	1323	2	6
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Mangalo	*	4	8
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Meningie	‡	4	1
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Minlaton	1323	2	6
Mitchell	1326	4	1
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Monteith	1331	—	—
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Morgan	1332	—	—
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Mount Bryan	1316	4	1
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Branch.	Report on Page	Dates of Meetings.	
		July.	Aug.
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McNamara Bore	*	—	—
Nantawarra	1321	8	5
Naracoorte	*	11	8
Narridy	*	—	—
Narrung	1339	—	—
North Booborowie	1314	—	—
North Bundaleer	1317	—	—
Northfield	1322	7	4
Orroroo	‡	—	—
Parilla	1333	—	—
Parilla Well	*	—	—
Parrakie	1332	4	1
Paskeville	*	2	6
Penola	*	4	1
Penong	‡	11	8
Petina	*	—	—
Pine Forest	*	7	4
Pinnaroo	1333	—	—
Port Broughton	*	3	7
Port Elliot	1338	18	15
Port Germein	†	11	8
Port Pirie	1317	—	—
Quorn	13 4	—	—
Redhill	1317	7	4
Renmark	*	—	—
Riverton	‡	—	—
Roberts and Verran	1326	—	—
Saddleworth	*	17	21
Salisbury	*	7	4
Salt Creek	1327	—	—
Shannon	*	—	—
Sherlock	*	—	—
Spalding	‡	17	7
Stockport	†	—	—
Strathalbyn	†	—	—
Sutherlands	*	—	—
Tarcowie	*	8	5
Tatiara	*	4	1
Tintinara	*	—	—
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Warcowie	*	—	—
Watervale	1322	—	—
Wepowie	1312	—	—
Whyte-Yarcowie	‡	—	—
Wilkawatt	1333	—	—
Willowie	1313	—	—
Willunga	*	4	1
Wilmington	1313	8	5
Wirrabara	1313	11	8
Wirrega	*	—	—
Woodside	1339	—	—
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Yadnarie	1327	4	1
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* No report received during the month of June. † Formal report only received. ‡ Held over until next month.

ADVISORY BOARD OF AGRICULTURE.

Dates of Meetings—

July 15th and August 12th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

Edited by George G. Nicholls, Secretary Advisory Board of Agriculture.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

AMYTON (Average annual rainfall, 11·82in.).

Present: seven members and three visitors.

Wool-Growing *versus* Lamb-Raising.—In a paper dealing with this subject, Mr. J. J. McCormack said—"Outside of Goyder's line of rainfall, and within what is commonly known as the fringe country, it is imperative for the landholders to go in for a system of mixed farming, such as wheat cultivation and dairying, or sheep-raising. The chief drawback with which the average Northern farmer has to contend is that for mixed farming his holding is too small. With the average holding consisting of about 1,000 acres, it behoves the farmer to get the best possible return from the pasture at his command. He should avoid bareing his pasture grasses to the roots, causing the best of his soil to drift. From experience of both dairying and sheep, I find the latter most profitable. I have been keeping sheep since 1904. I was informed that breeding ewes and lambs was the most profitable undertaking. This is the first mistake I made, for I obtained my information from a farmer situated in a far more favorable district as regards rainfall. I purchased 400 four-tooth Merino ewes and mated them with good Merino rams. The result was a lambing of 70 per cent., *i.e.*, 280 lambs. Owing to the absence of greenfeed in the autumn, 1905, the ewes did not have sufficient milk, hence the lambs were stunted. A favorable season followed. Only 120 of these were suitable for freezers. This left me to carry over the summer, 1905, in addition to my breeding ewes, 160 lambs, making a total of 560. I again mated the ewes with good rams, but owing to carrying so many sheep through the summer months I was left with no surplus feed at lambing time. Rain held off until May, and the result was the loss of 30 per cent. of the ewes and 70 per cent. of the lambs. If a farmer intends to rear lambs the market is no place for him to purchase his ewes or rams, as, with very rare exceptions, he will secure a considerable number of inferior ewes, the result of culling off shears. It pays the farmer many times over to purchase a good strain of breeding ewes privately from such stations, for instance, as Bungaree, Canowie, or Carriewerloo. The same applies to the selection of rams. A ram costing five guineas will be much cheaper to the purchaser than a ram costing, say, 30s. It does not pay to keep inferior ewes and rams. On the local plains, however, I have noted, during the past three years in particular, farmers who had incurred big expense in procuring a good type of ewes with high-priced rams have been compelled to sell them at a sacrifice. For this reason I advocate keeping dry sheep. My objections to ewes and lambs are—they involve a big outlay in purchasing good quality young ewes and rams, with a great risk, owing to the uncertainty of the rainfall. The farmer cannot take advantage of weather conditions, as lambs must be dropped in April to ensure their being ripe in September, and also on account of the grass seeds. There are too many reject lambs unsuitable for freezers, which necessitates the owner carrying them over till the following year. This requires a considerable quantity of feed and reserve paddocks, which the average farmer cannot spare; also a reserve of fodder as well, in the event of

it being necessary to hand feed. In the event of a dry season a farmer is much handicapped in travelling his ewes and lambs to fresh fields. Dry sheep are better for the following reasons :—The farmer can easily ascertain just the number of sheep to graze on his paddocks, and they will improve in condition under much less favorable circumstances than the ewes and lambs. He has the option of selling his sheep fat in the wool, or if not fat he can shear them, when they will fatten off shears. Butchers' sheep are always in demand. He can sell out at the beginning of the summer months and re-stock in the autumn, thus giving his pasture a chance of a good seeding—a most important point which is often overlooked. He can travel his sheep long distances in the event of a shortage of feed, without inconvenience." Members agreed in general with the statements of the writer of the paper.

ARDEN VALE AND WYACCA (Average annual rainfall, 16·65in.).

June 8th.—Present : five members and three visitors.

Horses.—Mr. O. Eckert read a paper. It did not pay the farmer with a holding of about 800 acres in the North, he said, to breed horses for filling up gaps in the team. Rather than feed young stock, when feed was plentiful he would cut and stack it. Mr. M. Eckert would only keep one extra animal to replace any losses in a team of eight horses. The Chairman (Mr. J. H. Willis) and the Hon. Secretary (Mr. O. E. Hannemann) did not approve of the "one-team" system of farming, as in the event of rain holding off, it became very necessary to get the work done quickly

MOUNT REMARKABLE (Average annual rainfall, 23·04in.).

June 3rd.—Present : 17 members.

Breeding Pigs.—The Hon. Secretary read a paper recently written and read by Mr. P. T. Bowker at a meeting of Laura Branch (see page 1186, June, 1914, issue). Members were well pleased with the paper, but noticed that in his statement of profits, Mr. Bowker had not accounted for initial cost of pigs, nor for the cost of labor given in attendance on the animals. With respect to floors—some had had success with cement floors, others with stone-paved floors. It was mentioned that in the south farmers used slab or woodblock floors exclusively, as stone and cement tended to cause cramp and rheumatics. Mr. Giles stated that, in mixing concrete for the floors, he found it saved much hard work to thoroughly mix the other ingredients before adding the broken stone. The meeting also agreed that the Berkshire pig had few equals, though Yorkshire and English Black were very fine. Jerusalem artichokes were noted as good pig fodder. The pigs could be turned into the artichoke bed, except at such time as was necessary for the plant to re-establish its growth. Mention was made that pigs would root up and destroy soursob, but some said that the animals were not persistent and thorough enough to do much good. Mr. G. Yates, jun., spoke of his success in killing soursob by covering it with wheat chaff to a depth of 6in.

WEPOWIE (Average annual rainfall, 13in. to 14in.).

June 2nd.—Present : seven members and three visitors.

Sheep.—A paper dealing with sheep breeding was read by Mr. J. Burns. He thought the Merino the best all-round breed of sheep, and described the particular points of the Merino ram. He thought it better to breed with two-tooth rams or ewes, except in cold wet districts, than to keep the ewes for an extra 12 months, returning nothing but their wool. Whilst the two-tooth ewes would not make such good mothers as the older sheep, if given plenty of feed and water during lambing, they would give good results. Lambs should be dropped in April or May ; early lambs were best. The period of gestation in the ewe was 21 weeks three days, and a careful note should be made of the date on which the rams were put with the flock. They should be left with the ewes for eight or nine weeks. One ram was necessary for each 50 ewes ; 3 per cent. would be even better. About four weeks after they were dropped the lambs should be tailed and earmarked, and the ram lambs castrated. For tailing, it was best to use a knife, which should be dipped in a warm 5 per cent. solution of washing soda after each two or three lambs had been treated. In grass country it was necessary to cut the wool away from the sheep's eyes twice or three time during the year. Three weeks or a month before lambing the ewes should be breeched. They should not be caught by the legs, but carefully picked up in the arms, and set down again. A clean cut 3in. or 4in. wide should be made from the udder to the anus, and then on both sides to the root of the tail. A good clean water supply was of the utmost importance, therefore watering from troughs was preferable to dams,

WILLOWIE (Average annual rainfall, 11·90in.).

June 12th.—Present: seven members.

Farm Harness.—Mr. W. B. Bull read a paper on the treatment of farm harness. He mentioned that the quality of the leather used in the manufacture of harness at present was not so good as it had been in the past. Harness should be washed and dressed with the best neatsfoot oil two or three times a year. It should be protected from the ammonia fumes which arose from manure in the stables. The straw-stuffed pipe collar was best, and judgment should be used in regulating the draught. Bridles should have double buckles on the cheeks, the face band being in one strip. Messrs. Gray and D. McCallum preferred to have the harness hung in the stables. Mr. Hawke demonstrated a method of relieving pressure on the points of the shoulder of a horse doing cart work.

WILMINGTON (Average annual rainfall, 18·26in.).

June 3rd.—Present: 11 members.

Care of Harness.—In a paper dealing with this subject Mr. Benier said that as the farm harness frequently represented an outlay of up to £150 it should receive due care and attention. He advised the use of the piped collar. This should fit neatly and firmly on the shoulders, and each horse should have its own. A collar that was flat, or otherwise out of shape, should be restuffed. Sweat and dirt should be removed regularly. The draught on the hames would very frequently be found responsible for sore shoulders. When the animals' shoulder galled the lining of the collar should be depressed to prevent it bearing on the sore part. The substitution of a breastplate might overcome the difficulty. Large-sized wagon saddles were best. When working teams winkers were preferable to the open bridle, as the latter enabled a lazy animal to slacken off if the driver's attention were diverted. Heavy harness should be dressed with neatsfoot oil: lighter harness should be thoroughly washed with soft soap and water, and dressed when dry with harness composition. A repair outfit should always be at hand. Members agreed, and thought neatsfoot oil mixed with lard a good dressing for all kinds of harness. Too much oil, however, would cause the leather to rot.

WIRRABARA (Average annual rainfall, 18·91in.).

June 6th.—Present: 16 members.

Fodder Plants.—Mr. P. J. Curnow read the following paper:—"In a comparatively dry part like Wirrabara and surrounding districts it is a matter for surprise that farmers and dairymen have not taken up the question of laying down experimental blocks of fodder plants other than lucerne. There are many plants worthy of trial, that do well in other parts of this and other States. In some seasons, such as the present one, there are no rains early enough to enable farmers to plough their land in time to get in early feed for stock, which is a serious difficulty, especially where cows are kept. Where permanent pastures are possible this difficulty can be overcome, as once a fodder, suitable to the district, is laid down it does not require much rain to start new growth. In this way it provides, at least, early pickings, which help cattle over a period when the natural grasses have not yet come up, and when there is so little to assist in the production of milk. For summer feed the sorghums, millet, and maize are the most suitable. These are annual, and give a cutting after each rain before frosts appear. Early Amber cane is the best for horses, although some seasons it is difficult to get them to eat it. For cattle any of the sorghum family are good, and do well, when once started, in the spring with occasional showers. Quite a number of grasses do well during the summer if irrigation is available; but where water supplies are highly mineralised, and irrigation is impracticable, only such fodder plants as will stand the dry weather without water will suit most local farmers. One variety of grass that does well on flats, in good soil, is *Paspalum dilatatum.* It grows about 3ft. high, and is relished by cattle, and can be cut several times during the summer, and will last for years. A variety, well spoken of as a summer fodder in Queensland, is the New South Wales Rhodes grass, and it is one worthy of attention here. It withstands drought, and provides excellent fodder in dry weather. Such other grasses as Meadow Foxtail grass, Mitchell's grass, cocksfoot, crested dogstail, prairie, meadow fescue, Chuerney's fescue, perennial rye, and Yorkshire fog grass are worth a trial. For early winter feed, *Phalaris commutata*, millet grass, annual meadow grass, Texas blue grass, and Kentucky blue grass should be grown. Among the clovers for early winter feed these varieties are worthy of mention:—*Trifolium subterraneum*, Berseem or Egyptian clover, and Italian crimson clover. Berseem has done well at Roseworthy, and is a quick grower. The above varieties of grasses and clovers should help stock owners to solve the ever-present difficulty of providing early winter and summer feed, for in our variable climate a variety is needed. In the writer's opinion, it is a mistake to pin one's faith to one or two fodders to produce feed for large quantities of stock." A lengthy discussion followed, and several members intimated their intention of testing different varieties of introduced grasses.

QUORN, June 6th.—It was decided to issue a suggestion that farmers in these areas should sow small plots of kale, rape, and lucerne as feed for cows and poultry on the farm.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

BEAUFORT.

June 4th.—Present: nine members and two visitors.

Sheep on the Farm.—Dealing with this subject in a paper Mr. C. Wilson said farmers should rear sufficient sheep to provide for the requirements of the homestead, and not be dependent on purchasing stores. The class of animals he recommended was the progeny of the Merino ewe crossed with the Dorset Horn ram. The skins would then be saleable at a good price; with the Comeback ewe and the Shropshire ram this was not so, as the wool was dark edged. The skins should be hung neck downwards and extended with two spreaders. Mr. A. Gard advised purchasing fat sheep rather than stores on account of the uncertainty of grass being available. Merinos were most payable. Mr. J. Sampson mentioned that tick and lice would not thrive on sheep in this district. Mr. W. W. Mugford (the Chairman) said the farmer must keep a few sheep if he would work his land economically. These should be bred on the farm, and the Merino would be found most suitable. Dipping was beneficial to the sheep. Mr. P. H. H. Underwood agreed and favored the Merino. At shearing time aged sheep could be culled, fattened, and sold. Generally members recommended the Merino, and agreed that it was advisable to paint the skins with a wash to preserve them.

BELALIE NORTH (Average annual rainfall, 16in. to 17in.).

May 10th.—Present: 10 members and five visitors.

Preparations for Seeding.—In initiating a discussion on this subject Mr. I. Gullidge recommended crossing the ploughing with the cultivator, and then harrowing. The drilling should then be across the cultivating. Harrowing before the drill ensured the seed being buried to an even depth. He pickled his seed about one week before sowing when the ground was dry. Mr. O'Leary agreed that it was best to cross-work the land. He attached a harrows to the cultivator. Mr. Smart and Mr. Bradtke also agreed. Mr. Hall pickled his seed by dipping a bag at a time, but Mr. Warner expressed the view that the inside grain was not properly treated when this was done. The grain should be in butts. Graded seed should be sown, with which opinion Mr. Fox concurred.

BOOBOROWIE.

May 7th.—Present: 12 members and two visitors.

Cultivators.—An address on this subject was given by Mr. F. E. Waddy. Cultivation was necessary for the conservation of moisture, the destruction of weeds, and the preparation of the seed bed, he said. The time to cultivate was governed mainly by the rainfall. Rains caused the weeds to germinate on the fallow, and caked the surface so that in order to keep the fallow clean and conserve moisture it was necessary to cultivate after each rain, deeply shortly after fallowing and then shallower on towards seeding time. Cultivating, if done at the proper time, put the ground into a fairly fine nobbly condition. It neither left it lumpy (which encouraged takeall) nor did it pulverise it to a fine dust, which was liable to set down very hard at the next rain. The advantages and disadvantages of the various forms of cultivators were outlined as follows:—The lockspring cultivator, which could be obtained with tines arranged in form of a V or staggered, was good. The spring was not in action while the share was in the ground, but simply threw it into the ground after it had jumped. The staggered tine spring-tooth cultivator made a splendid seed bed in clean land, but easily became blocked with rubbish, straw, &c. The V-shaped spring-tooth cultivator became blocked less easily, but had the disadvantage of leaving the land ridged. Bridle draught cultivators were good on level country, but when the machine ran on the horses going down hill the shares were not held in the ground. The skim plough was a good implement, but had the disadvantage that it was necessary to work round and round a piece of ground, so that at seeding time it was not possible to work the drill close behind it. The speakers' views were freely discussed. Mr. Waddy said, in answer to a question, that he favored ploughing in straw at fallowing time when practicable, but the straw proved too troublesome at times as it blocked the plough.

CANOWIE BELT (Average annual rainfall, 20·04in.).

June 6th.—Present: 15 members and three visitors.

Livestock on the Farm.—Mr. G. Kirk read a paper. He preferred the medium draught horse for farm work. Breeding mares should be kept in good condition, and worked up till within a month of foaling, in a plough or cultivator; but not in a heavy dray or trolly. When being weaned, foals should be shut up for four or five weeks, and fed on hay chaff, with a little oats added. Rocksalt should be available to the animal, especially when dam or tank water was used. Molasses and chaff constituted a good feed, being of considerable medicinal value. Foals should be kept in good condition until they were broken in; kindness was essential in breaking. After the animal had been taught to lead, it should be placed between two quiet horses and driven about for a while. If the farmer could provide sufficient feed and water, and the necessary labor, it would pay him to keep six or eight cows. A good straw stack, with molasses added when it was being built, would provide shelter and a certain amount of feed. The animals should be milked twice daily, the milk being separated whilst still warm. They should be dried off six or eight weeks before calving. Calves should not remain with the mothers. Pigs, sheep, and poultry should be kept on the farm; the last-named being shut up at night. The Wyandotte-Black Orpington cross was best. It was generally agreed that foals would do well shut up and fed on hay chaff, with bran or molasses, if a yard for exercise were connected with the stable. Mares in good condition could be given light work up to within a few days of foaling. Hay chaff, with plenty of oats or bran, was best for working horses.

Stripper versus Harvester.—Mr. W. A. Carter, in a short paper, advocated the use of the stripper and motor winnower on large holdings. With this method the crop could be gathered more cheaply and more quickly. The general opinion of members was that in a district like this, where the holdings were small, the complete harvester was preferable to the stripper and winnower. Carriers could be fixed to the harvesters to save cocky chaff.

GLADSTONE (Average annual rainfall, 16in.).

May 2nd.—Present: 20 members and four visitors.

Farm Management.—Mr. R. Peters read a paper on this subject. In answer to questions, he advised breeding pigs and sheep rather than purchasing, although it would probably pay to buy on small farms. Oats and barley should be sown at this time of the year for feed. Summer fallowing was advisable, and the land should be worked with a light plough; the skim plough was better than the cultivator for this work. Difficulty in obtaining labor made ensilage unpayable on most small holdings. Cocky chaff made better feed than chaffed straw. Members generally agreed that it was advisable to harrow growing crops in heavy soil, but light or sandy land should be carefully treated in this respect.

GLADSTONE (Average annual rainfall, 16in.).

May 30th.—Present: 13 members and one visitor.

Pickling Wheat.—Mr. Coe read a paper. He advocated the disinfection of machines, and then outlined a method of pickling seed with bluestone. A box fitted with cross pieces for draining the bags, and a lever attached, should be used. The box, having sloping sides, should measure at the top 4½ft. by 2ft., and be 2½ft. deep. The bag should be lowered on its side into a 1¼ per cent. solution, left from two to three minutes, and then allowed to drain. The seed was ready for sowing next day. Mr. Coe then read an article upon the same subject by Mr. Ross, of New South Wales, who said a 1¼ per cent. solution of bluestone was the best pickle. Care should be taken not to drain the bags on galvanizd iron. Sowing should take place the day after pickling. A very strong solution of bluestone would destroy bunt, but it might also destroy the seed, and to avoid this danger the bluestone wheat should be placed in a solution of ½lb. lime to 10galls. of water. Fresh lime or a mixed solution of lime and bluestone should not be used. An interesting discussion then followed. Mr. Brayley advocated pickling on the floor with bluestone, but would use boiling water. He considered that the steam played an important part in the process. Mr. Humphris instanced a case in which very smutty seed, although not pickled, produced a clean crop. The reason for this was that the smut germinated and died before the wheat grew.

LEIGHTON (Average annual rainfall, 16in. to 17in.).

June 4th.—Present: 20 members.

Care of Harness.—In a paper on this subject, Mr. S. Cordon said that owing to the different system of tanning now adopted, leather produced at present was not equal to that produced a few years ago, consequently every attention should be paid by the farmer to his harness, more especially so as the prices of all kinds of leather were higher at the present time. On no account should harness be thrown down on the ground, or left out at night in the paddock. It should be hung in a dry shed or harness room when not in use. He preferred a round rail, fixed about 3ft. 6in. from the ground, on which to hang collars, each being passed over the rail. This made it easier to get just which collar was required. Pegs should be provided for winkers, spiders, saddles, &c. When stitches were noticed to be coming undone, or a breakage discovered, it should be attended to immediately, preferably by sewing, or by the use of copper rivets. The latter should not be too large, or used too plentifully, for too many rivets weakened the harness. Harness should be thoroughly cleaned and oiled at least twice a year, preferably at the beginning and end of winter. A tub half full of water, soapy if desired, and not too hot to preclude the harness being being placed in it, should be provided on a sunny day. In this the leather should be thoroughly washed. Traces, girths, belly bands, and all parts on which there was an accumulation of sweat, should be attended to first while the water was hot. After washing it should be placed in the sun to dry, this being followed by an application of neatsfoot oil, or some other good preparation. A mixture found useful for harness in wet rough work, and where mice or rats abounded, was two parts neatsfoot oil, one part resin, and one of tar. The oil kept the fat soft, the resin kept out the water, and the tar prevented the rats chewing it. Neatsfoot oil was also very good, and for a riding saddle the white of an egg rubbed over the neatsfoot oil kept the oil from coming off on the clothes, and gave the saddle a glossy appearance. Every farmer should have on hand a kit of needles, wax end, pincers, rivets, punches, &c. Members discussed the paper at length. Mr. W. Bailey did not agree that the white of an egg applied to a saddle previously treated with neatsfoot oil would prevent the oil soiling the clothes of the rider. Mr. Ham thought it would. Mr. J. McDonald used neatsfoot oil and tallow to soften and preserve harness. The Hon. Secretary (Mr. W. H. Lloyd) thought cod preferable to neatsfoot oil.

MOUNT BRYAN (Average annual rainfall, 15·81in.).

June 8th.—Present: seven members.

Irrigation.—This subject was dealt with in a paper by Mr. A. Jefferies. After drawing attention to the disabilities which were experienced in the absence of an adequate water supply, and detailing the steps which had been taken in the South-East to remove the surplus water by means of surface drains, the paper read—"One of the greatest drawbacks in our State is the scarcity of water suitable for irrigating. In nearly every district, however, water suitable for stock can be procured by sinking, although in many cases it is at a great depth; consequently dam sinking is resorted to. This, if carried out on a sufficiently large scale, is very suitable. There are many places suitable for the construction of large dams, which could be formed at a comparatively small cost by erecting embankments across watercourses or natural valleys, and the water thus conserved would be of great value in our dry districts for growing small quantities of green feed, which would be very valuable during the summer time. In this district good water can be obtained in most places by comparatively shallow sinking, and I am of opinion that the time is not far distant when this source of supply will be much more availed of than it is at present. Of course, with an underground supply there is always the question of raising and distributing. This is a matter of great importance and one which requires a good deal of consideration, as a mistake in the first place often costs the individual a great deal of time and money. The windmill is the cheapest method of raising water, and one would almost think, on a casual observation, that there was no limit to the motive power for this method, yet it is very unreliable. In my opinion, water for irrigating

must be raised with the motor engine. With one of these one can rely on the supply when it is needed, which is absolutely essential for successful irrigating."

MOUNT BRYAN EAST (Average annual rainfall, 16in.).

June 9th.—Present: 12 members.

Sheep.—In a paper dealing with sheep on the farm, Mr. W. Gare said sheep did well in the stubbles. Especially was this the case with forward lambs. Placing them there enabled the grass paddocks to be saved until lambing commenced. It was much better to feed the green stuff on the fallows to sheep than to plough it under. A good system was to run the flock on the stubbles and sell the fats, allowing the ewes to remain for two or three months.

The Chairman (Mr. J. Thomas) gave an instructive and interesting address dealing with a trip to Beltana Station.

NORTH BUNDALEER.

June 3rd.—Present: 13 members and four visitors.

Bulk Handling of Wheat.—Mr. P. E. Kelly read a paper on this subject. The gist of the finding of the Royal Commission which dealt with this subject, he said, was that bulk handling was feasible and desirable, and would result in a great saving to the farmers. As it had been stated that the jute business was in the hands of a combine, he thought the price of bags was likely to rise rather than fall. The money that the farmer would save in bags in a few years would enable him to erect a stone barn with a cement floor in which to store his grain. Members were divided in opinion as to the benefits to be derived from the proposed system.

PORT PIRIE (Average annual rainfall, 13·21in.).

June 6th.—Present: 11 members.

Experimental Plots.—The experimental plots laid down by the Branch, consisting of 20 half-acre plots, were reported as having been sown with different varities of wheat at the rate of 60lbs. per acre, together with 56lbs. of super. per acre.

Noxious Weeds.—A paper dealing with useless and noxious weeds which were found in this district, was read by Mr. E. J. Eagle. These included the star thistle, the Bathurst bur, and stinkwort. Potato weed was at times a nuisance on the fallow, but it was useful in that it tended to prevent sand drift. When dry it was easily broken up, or destroyed with a cultivator when young. Buckbush, like the potato weed, was a summer plant; but, being a valuable fodder, its appearance was welcome. Wild turnip was troublesome in a wheat crop, but stock ate it readily, although too much of it tainted both milk and meat. Sheepweed, poppy, cockspur, &c., could be kept under by cultivation. The star thistle was likely to cause most trouble in the district, and single plants should be destroyed immediately they appeared. Similar treatment should be meted out to the Bathurst bur. Mr. Hawkins mentioned that the paddymelon thrived luxuriantly in sandy soil; if left to develop to any size, and drift was prevalent, large banks of sand would result. The melon was easily destroyed in the early stages of its growth. The star thistle, nanny weed, and native horehound had given him considerable trouble. Mr. J. Greig said the iceplant was a curse where it established itself. He advised tramping it to a pulp. At certain stages of their growth. the Scotch and star thistles could be killed by mowing. Mr. Welch said cattle would fatten on paddymelon, and whilst on it would need little water. The three-cornered jack was very troublesome. Messrs. Munday, Kirchner, and the Chairman (Mr. McEwin) also spoke.

REDHILL (Average annual rainfall, 16·79in.).

June 9th.—Present: 16 members and one visitor.

Question Box.—A number of questions were replied to by members. Mr. Button recommended seeding at the rate of 1bush. to 1¼bush. per acre for grain. Mr. Stone would sow 1bush. and upwards, according to the nature of the season. Mr. F. A. Wheaton thought a lesser quantity of good seed would suffice. The fat lamb industry, he said, had been checked considerably by the drought, but with sufficient rainfall to enable fodder crops to be grown, lamb-raising should become profitable. Mr. Coffey favored cropping every two years, otherwise trouble was experienced with weeds. Mr. F. A. Wheaton thought cropping every two years would result in the fertility of the land being decreased, but this could profitably be adopted for several years and the land then left out for a period. Mr. Coffey thought hoes on the seed drill were too far apart. If the seed were sown closer the crop would not go down so easily, and Mr. McAvaney thought this would help to check the growth of weeds. Mr. Kelly said there should be two or three wheat standards, so that if a farmer cleaned his wheat well he would receive a higher price for it. Mr. F. Wheaton thought this would increase expenses at station yards and ports of shipment. Mr. Pengilly said the standard should be fixed earlier in the year. Mr. Stone mentioned a test which resulted in a crop harrowed when growing yielding twice as much as a similar area not so treated. He had harrowed wheat when it had reached a height of 6in. Mr. Coffey said care not to overstock was the best provision against shortages of forage. Mr. J. McAvaney advised saving cocky chaff and recommended using the header or thresher.

YONGALA VALE (Average annual rainfall, 13in. to 14in.).

June 6th.—Present: nine members and three visitors.

Sore Shoulders.—In a short paper on this subject Mr. J. Barker advised carefully brushing horses' shoulders before the collars were put on. If immediately a lump occurred on the shoulder a hole were made in the collar, and no bearing were allowed on the lump, it would disappear. A solution of bluestone, applied to the shoulders after each day's work, would tend to prevent the trouble. New collars should be soaked in water before being used. Members advised application of bluestone and kerosine in the case of sore shoulders, but if well-fitting collars were used there should be little difficulty with this trouble.

Rolling and Harrowing Crops.—Mr. E. Cooper read a short paper. The effect of rolling a crop, he said, was to consolidate the soil around the stems and roots of the wheat plant, thus ensuring better growth and to level the ground, and so facilitate harvesting. As the wheat plant required a firm seed bed the roller should precede the drill. The crop should be harrowed when it reached a height of 4in., the harrowing being across the drilling for preference. The paper provoked a lengthy discussion.

BEETALOO VALLEY, June 8th.—Mr. A. Bartrum read a short paper dealing with the care of farm horses, and an interesting account of a motor trip through the gardening districts of the State was given by Mr. Burton.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BALAKLAVA (Average annual rainfall. 16·03in.).

June 13th.—Present: 11 members.

Co-Operation.—The Chairman (Mr. H. L. Twartz) introduced a discussion on this subject. He mentioned the need of farmers combining in the purchase of their requirements in order that they might keep the cost of producing wheat as low as possible. He drew attention to the success which had attended the efforts of producers in England and New Zealand in co-operation. The success of the movement rested on the loyalty of the farmers. Messrs. Butler, Neville, Goldney, Roediger, Anderson, and Spillane also spoke.

BLYTH (Average annual rainfall, 16·46in.).

June 6th.—Present: 22 members and two visitors.

Poultry.—Mr. Alf. Dunstone read a paper. In order to secure the best results from poultry, he said, it was necessary to have them penned up. When loose they were a nuisance about the yards and stables, caused waste at the haystacks, and there was no assurance that the eggs, when gathered, would be fresh. Losses, through accidents and foxes, also were heavy. Suitable roosting houses and yards, although involving a somewhat heavy initial outlay, would in time prove best. Separate yards should be provided for the breeding stock, the laying hens, and cockerels. The cockerels should be fattened and marketed at the age of from 14 to 18 weeks. Generally on the farm broody hens would be found more satisfactory for hatching than incubators. Stable manure could advantageously be placed in the yards; this would give the birds exercise and a certain amount of food. For egg production only the White Leghorn was the best fowl, but from the farmer's standpoint it had disadvantages. Eight feet fences were necessary to confine it; it was very poor for the table, and a poor mother. Better farmers' fowls, he thought, were the Andalusians, Black, White, and Buff Orpingtons, White, Silver, and Golden Wyandottes, and Barred and White Plymouth Rocks. White Orpingtons perhaps were best of these. Continuing, the paper read—" When keeping fowls in confinement it is necessary to keep a supply of clean water available, also grit of different sorts. The fowls should be fed twice a day; the grain food should be scattered amongst the litter as much as possible to give the birds exercise. Greenfeed should be given every day. This can easily be managed if the farmer has a small plot of lucerne. Even if fed to them long it will prove very beneficial, but to get the best results it should be chaffed, which can very easily be done when the hay is being chaffed for the stock. It will increase egg production and assist in keeping the fowls in a healthy condition. Silver beet is another good green food for fowls; it is easily grown, and if well watered can be cut very often and the plants will last for a long time without going to seed. The eggs should be gathered as often as possible: not less than once a day, and be kept in a cool place until sent to market. When packed for market they should be graded, as the smaller eggs will always reduce the value of the larger. The best time for hatching is July, August, and September, as it gives the chicks a chance to get strong before the hot weather sets in. The breeding pen should be broken up about October, and not mated up again until about February or March. This gives the male bird a chance to become strong and well, and hence his stock will be more vigorous and robust than if he is left with the hens. When choosing the rooster for the breeding pen select a bird that is strong and healthy, with plenty of life in him, and one that has been hatched from an egg laid by a good layer. It is not always the best bird from an exhibitor's point of view that will prove the most profitable bird from which to breed." Mr. Deland thought the White Orpington the hardiest and best all-round fowl. Mr. J. Pratt favored the White Wyandotte.

JULIA (Average annual rainfall, 18in. to 19in.).

May 9th.—Present: nine members and five visitors.

Handling Wheat in Bulk.—In a paper on this subject Mr. J. Dunstan said he failed to see that farmers would secure any benefit by the introduction of the system of handling wheat in bulk. The cost of the change would be considerable, and farmers would still have to provide bags in which to market the grain. The price received for the loose grain would not be so high as that paid for bagged wheat. Whilst it was admitted that the grain could be cleaned at the elevators this would have to be paid for, and it would be better for the farmers to do the work themselves and feed the small and cracked grain to poultry and other stock on the farm. As the cost of jute was between 3d. and 4d. per pound, and a wheat sack weighed 2¼lbs., the raw material, it would be seen, cost 6d. This would eventually be reduced, he said, by larger areas being planted in India. He advised farmers to order two-thirds of their estimated requirements of sacks as early in the season as practicable, thus avoiding "famine" prices. The co-operative purchase of sacks might be tried with advantage.

LYNDOCH (Average annual rainfall, 23·01in.).

June 4th.—Present: 16 members.

Fodder Crops and Stock.—The Chairman (Mr. G. W. Warren) contributed a lengthy paper. Owing to the popularity of the motor vehicle, he said, the market for hay was becoming rapidly restricted. As the price of grapes was now so good, growers were encouraged to plant extensively; but it should be remembered that the local demand for these was limited, and high prices would not be maintained when the vigneron had to depend on the export trade. It would be a wise policy, therefore, for those engaged in farming on high-priced lands, to give some of their attention to raising and fattening livestock, especially in view of the high prices prevailing for meat. On the smaller holdings in this district much more attention could profitably be given to pigs, which would consume a large amount of the waste from gardens and dairies. If first quality animals were bred, and properly cared for, a good export trade in frozen pork, bacon, and hams could be established. In a mixed farming area, such as that in which the holding of the writer of the paper was situated, sheep and lambs were the first consideration. Fat stock was at its highest value at the end of June, July, and in early August, thus it was essential that feed should be available during these months. He suggested that cereal crops should be planted earlier than was the general practice, and be fed off with sheep. This resulted in better crops, and also gave the grass paddocks a spell. *Rape.*—The value of this crop was enhanced if it were sown with barley and a little mustard. There was nothing better than this as an early fodder. Unless the seed germinated in March or early April, it did not make headway. Spring sowing was not satisfactory. On one occasion four acres of sandy soil was scarified after a thunderstorm, about the beginning of March, and drilled with rape. Over 100 wethers were fattened on this. Some of the land in the Lyndoch district, which had carried a cereal crop, could with advantage be gone over with a cultivator in the summer, and sown with about 4lbs. or 5lbs. or rape and 1bush. barley to the acre. With favorable rains in March an excellent growth of feed would be secured. Silver beet and rye might also be tried. Continuing, the paper read :—" Some of the farms about Reeve's Plains grow patches every year. The rye is cut as green feed for the cattle and horses, and allowed to mature about September, when it is stripped. The opinion is that rye grain has a higher feeding value for pigs than barley. The straw is twine bound, and a limited amount meets ready sale in Adelaide at the horse-collar factories at very payable prices. I understand, too, that if rye is not allowed to attain the height of more than 1ft. it will outlive a summer, and provide a crop the following year. *Peas.*—The value of this crop is not half recognised. I can but admit that this year's crop did not yield the results of the previous years, but the last erratic and bad season, no doubt, accounts for this. I, however, fattened 500 lambs on about 35 acres. The lambs were in very poor order when weaned. Everyone should give peas a fair trial in place of bare fallow; thus sowing a rotation, and the land producing a crop every year, although it may be beneficial to spell the paddock every third or fourth year. The pea crop could be followed, say, by wheat, and scarified up the following year for oats and rape for feeding. A light rain will practically spoil the feeding value of peas. I have had no success with summer crops, such as maize, sorghum, and millets, during the last few years. So much depends on planting just at the right time, and moisture must be applied by artificial means, although a good rain when the plant is well up ensures success. These crops should be planted wide enough between the rows to be horse-hoed, and are benefited very much by a summer stirring of the ground, even in the absence of rain. Millets grow far more stems than sorghums, and can be cut more than once. The stems do not grow so strong, resembling more a grass. I advocate planting maize and sorghum in the same drills, and cutting the maize when it matures in December or January. The sorghum is then available later, and in a favorable season a second or even a third cut can be made. The value is enhanced by putting the stalks through a chaffcutter. Maize is richest in feeding value; it is a great fodder for pigs. Care must be taken not to feed sorghum in its earliest stages of growth, as it contains prussic acid; this, as the plant matures, changes into sugar. In many countries the carob bean is used largely as a fodder, and although a slow grower, it is a very handsome tree, very shady and one that could with advantage be more widely planted. Tagasaste was boomed some time ago, and, in my opinion, it is very much over-rated. In Scotland gorse is cultivated very extensively on poor soils, and is worthy of a trial here on some of our scrub lands. It thrives practically everywhere, but must not be allowed to reach hedge dimensions. Horses, sheep, and cattle are very fond of it, and thrive on the young shoots. Lucerne will stand rougher treatment than is generally supposed, provided, if fed off, it is allowed to run to seed occasionally, and 1 ton of lucerne hay, well cured, contains as much nutriment as 1 ton of bran. It is cut with a binder at Turretfield, which makes the handling easier, and there is not so much waste through the leaves falling off when dry. *Phalaris commutata.*—After almost unlimited trials of various grasses I have discarded dozens in favor of *Phalaris commutata,* which I consider the most valuable introduced grass. It has the characteristics of our native grasses, grows whenever there is a vestige of moisture, comes on with the first rains, and produces abundance of fodder during the winter months. It fills the needs of the lamb grower, is invaluable to the dairyman, and provides feed during the winter when it is most wanted, and, in my opinion, is most valuable. This grass will do very well in this district; it is wonderfully strong-rooted, and grows into a tussock. I have on my best land a tussock 30in. in diameter, the outcome of one single seed in about five years. It throws out a wealth of flags up to 18in. in length during the winter, and then stalks for seeds tower up to 4ft. or 6ft. in height about spring. From a small bed of this I have cut hay at the rate of 4 tons to the acre without any attention or any extra moisture than that obtained naturally. It is my intention to plant this grass very largely on my farm. Probably the best introduced clover is the *Trifolium subterraneum.* Since the advent of phosphates the native clover has thrived wonderfully, especially on cultivated land, and one could not do better than instal *Trifolium subterraneum* in its stead. It produces more fodder, grows, if anything, more quickly, and does not carry the burr which is so harmful to wool. Every vestige of it is licked up by stock. It is the first grass to come on, with the exception of the native carrot, and the last to get dry. English clovers improve hay if grown with it, but as they seed in the air they do not propagate themselves well the following year. All clovers, which tend to collect nitrogen from the air, should be encouraged. The best of the other grasses I have tried are Paspalum and Johnson grass, but as these grow in the summer I have discarded them in favor of *Phalaris commutata.* Paspalum, however, especially the creeping variety, is a handy grass to plant in wet places, bogs and creeks especially, to bind the soil in a washout. Native couch grass is favorably spoken of. Rhodes grass and African Wonder grass have been tried in the Cockatoo Valley scrub. To sum up my experience, one cannot do better than stick to *Phalaris commutata* as a perennial, and encourage *Trifolium subterraneum* in cultivated fields. If a supply of water is available, lucerne should be grown. I thoroughly believe in small paddocks and shifting stock, say every fortnight. All grasses require a spell now and again, and I am convinced that they are benefited if allowed to run to seed every few years. They cannot go on producing unless they are manured occasionally. All grass paddocks are benefited by a light ploughing, or cultivating where possible. Fire burning through rank feed or stubble is splendid for the land."

MALLALA (Average annual rainfall, 16·88in.).

June 1st.—Present 11 members and one visitor.

Agricultural Bureau.—A paper on the subject of improving the effectiveness of the Branch's work was read by Mr. A. H. Marshman. He laid stress on the necessity for enthusiasm and regular attendance on the part of the individual members. The exchange of opinions on matters of agricultural experience was of great value, and homestead meetings, held twice a year, would prove very instructive. The inauguration of a question box would do away with the difficulty sometimes experienced in selecting suitable subjects for discussion, and the occasional tabling of farm products would probably encourage greater interest in the "side lines" of the farm. Branches might be well advised, also, to avail themselves more frequently of the services of the departmental experts. Once a year it was a good plan to hold a social night. As a result of the suggestions contained in the paper, it was decided that the Branch should have a question box, and a visit was to be paid to the holding of Mr. J. Nairn.

NANTAWARRA (Average annual rainfall, 15·90in.).

June 4th.—Present: 11 members.

Seed Wheat.—Mr. J. H. Nicholls read a paper. Particular note of the varieties which did best in the district should be taken, he said, and the wheat for seed should be selected from these. Barley was too prevalent in the early varieties, and to counteract this it was advisable to hand-pick the barley from the portion of the crop intended for seed subsequently. It should be reaped on a hot day when it was ripe and hard. Mustard, nanny wood, cracked grain, &c., should be carefully removed from the seed; these were much more profitable when fed to pigs than when sown. Wheat sown continuously on the same kind of soil deteriorated, especially was this the case with Federation. Therefore a frequent change of seed was advisable. Smut or bunt-infected grain should never be sown. The floor method of pickling was recommended. Mr. E. J. Herbert concurred that a hot day was preferable for garnering seed wheat. It should not go through the harvester or even stripper if it could otherwise be harvested. Years after the stripper was invented seed wheat was still selected by hand. He was of the opinion that in many things the farmers of to-day sacrificed efficiency to speed, and the time was coming when they would have to revert to some of the old-fashioned ways. Mr. Sleep preferred pulling the barley out of his seed wheat crop just as it came out in ear. He had tried going ahead of the stripper, but found he knocked down too much of the wheat crop. Farmers sowed too much per acre simply because of defective seed wheat. If all the grain sown, *i.e.*, a bushel and over to the acre, were to germinate he felt sure there would be insufficient room for the plants to mature. Therefore all the grain sown that failed to germinate was a waste. By pickling on the floor a great deal of the wheat was untouched by the solution. Mr. Uppill said it was imperative that good seed should be procured. Mr. Smith agreed that wheat gathered with the harvester was the worst to use for seed. Mr. Sutton tipped some seed wheat into a tub of weak pickle solution, and was astonished at the number of bunt balls and whiteheads that rose to the surface. He preferred the grader to the winnower for cleaning seed, as the former appeared to get rid of the barley better. Mr. Greenshields found that bluestone dissolved quite well in cold water. Mr. Dixon believed in pickling with bluestone, and had always found it a good preventive against smut. It was better to pull barley out of the seed wheat crop when it was in a green stage, otherwise the wheat stalks were brittle and were easily broken down. Mr. Nicholls, in reply, said he was quite convinced that pickling with bluestone prevented smut. He then explained that bunt was a parasitic fungus growth, and the spores required less moisture than wheat to germinate, consequently when wheat was sown in a dry state there was at times enough moisture in the soil to germinate the bunt spores but not the wheat. The bunt spores, having no host on which to subsist, died, and the wheat grew free from bunt. When wheat was sown under wet conditions, however, the spores and wheat sometimes germinated together, and the bunt spores flourished on the wheat. This accounted for self-sown crops being free from smut. Some of the bunt balls might not have been properly saturated with the pickle, consequently if broken when passing through the drill the live spores from the centre of the ball would affect the seed wheat on which they fell. The speaker confidently believed that all spores reached by the pickle were destroyed.

NORTHFIELD (Average annual rainfall, 19in.).

June 7th.—Present: 11 members and one visitor.

Tree-Planting.—Mr. Eastwood read a paper. Little attention had been given the cultivation of trees in this locality, he said. To provide an ample supply of firewood, fencing, &c., it was advisable to fence off three or four acres of the holding, and plant this with blue, white, or sugar gums, or better still, put half an acre in each paddock under these trees. The land should be ploughed to a depth of 5in. or 6in., and then harrowed, the trees being placed 20ft. apart in rows 25ft. apart. The holes for the trees should be 2ft. 6in. across, the soil being taken out to a depth of 15in., and then loosened with a pick. Planting could be done after seeding operations were completed. When the trees were five or six years old, one here and there through the plantation could be cut about 2ft. from the ground for use. Members agreed that trees added beauty to the homestead, checked the flow of storm waters, the drift of sand, provided shelter for cattle, timber for posts, and firewood, but land in this district was too valuable to be profitably used for afforestation purposes.

TWO WELLS (Average annual rainfall, 16·36in.).

June 9th.—Present: 11 members.

Hay.—In a paper on this subject, Mr. R. Kenner said the best wheats for hay were those of a light bright-green color, such as White Tuscan, Yandilla King, and Baroota Wonder. Cape and Algerian oats were good; these should not be cut before they commenced ripening. The best quality wheaten hay was secured from a crop about 3ft. high, cut before the grain ripened. The crop should not be cut or put into the stack when the temperature was very high, or when the hay was wet. Long, narrow stooks were preferable. The hay should be salted; in cool weather coarse salt should be sprinkled on each layer of the stack, and in hot weather the hay should be slightly damped, and then salted. A stack 21yds. by 6yds. would require 2galls. of salt to each layer. The centre of the stack should be kept full from the start. It should be built east and west, and covered with a thatch or layer of loose straw as soon as possible. The Chairman preferred the long, narrow stook. Mr. Dawkins said hay could be put into stooks of 50 to 60 sheaves, right after the binder, if the crop were cut when it was in the proper stage. Mr. Pratt preferred White Tuscan for hay; crossbred wheats, he thought, were not so nutritious. The crop should be in stooks three weeks before being stacked. The Hon. Secretary (Mr. H. Kenner) had grown mixed oats and wheat on light land, and this had met with a ready sale. Mr. Jenkins thought Baroota Wonder the best hay wheat. Oats should be grown on land that was wheat sick. Mr. Wasley thought it unwise to stook hay close behind the binder.

WATERVALE.—Mr. H. Baker gave an illustration of the method he adopted in pruning a Jonathan apple tree. Members discussed the method of pruning recommended.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

MAITLAND (Average annual rainfall, 20 08in.).

June 6th.—Present: eight members.

Fodder for Stock.—Mr. Hill read a paper in which he urged the wisdom of farmers making provision in years of plenty to tide their stock over lean seasons. Practices which could be adopted were to cut portion of the wheat crop with the binder, and thresh the grain, and after reaping go over the stubble with the binder, the horse rake, loose mower, or even drag a heavy railway rail over the straw on a hot day, and then rake it. Portion of the fallow each year should be sown with peas, rape, and mustard. He had ploughed in April a paddock which last year carried a hay crop. This now carried a self-sown crop 6in. high, which he proposed to feed off with sheep, and then work the land back as fallow for next year's wheat crop. Small paddocks near the homestead should be sown with (*a*) rye, mixed with white mustard; (*b*) barley and mustard, for second feeding; and (*c*) barley and tares, for ensilage. These plots should be heavily dressed with stable manure. Messrs. Jarrett and Bentley agreed with the remarks of the writer of the paper. The Hon. Secretary (Mr. Pitcher) thought it unwise to grow fodder crops on fallow, as the object of the fallowing was to conserve moisture, and this would be utilised by the fodder crops. Mr. Hill strongly urged members to test different fodders. He tabled a sample of Cape barley of fine growth from land that carried green feed last year, and was simply scarified and dressed with stable manure.

MINLATON (Average annual rainfall, 17·44in.).

May 7th.—Present: 10 members.

Classing Farmers' Clips.—In a short paper on this subject Mr. W. Bennett said it was not practicable for the farmer with a small clip to class it to any extent. When marketing, star lots should be avoided. The bellies and the leg ends should be taken off, and the fleece skirted right round, all wet and stained pieces being pulled off. Yellow fleeces, ewe fleeces, and wether fleeces should be kept separate. Every effort should be made to get the clip to market in as good condition as possible. Members agreed that on small farms classing clips to any extent was impracticable. They favored skirting the fleeces, and making the wool look as presentable as possible.

Afforestation.—The Hon. Secretary (Mr. J. McKenzie) read a paper. Tree-planting was much neglected in this locality, he said, notwithstanding the fact that the district was peculiarly adapted to the growth of trees, gums in particular doing exceedingly well. He drew attention to the probability of a shortage of timber in the near future, and enumerated some of the many uses to which it was put. Farmers were urged to plant a few trees every year on their holdings; these would not only beautify the farms, but in the course of years would be a source of revenue. Members agreed that tree-planting should receive more attention, and advised the preservation of native timber on portions of the farm.

MOONTA (Average annual rainfall, 15·22in.).

May 9th.—Present: 11 members and two visitors.

Mendelism.—An interesting and lengthy paper on this subject was read by Mr. W. Aplin. He dealt at length with the experiment which Mendel carried out to prove his theory of the laws of heredity. He detailed the practical applicability of these principles to plant breeding, and mentioned the difficulty in the fixation of types in hybrids. Members expressed a high appreciation of the paper.

June 6th.—A paper dealing with his impressions gathered during a visit to Western Australia was read by Mr. W. B. Stacey.

MINLATON, June 4th.—Feed was reported to be plentiful, and early-sown crops were looking well, although rain was needed, as the ground was setting down hard. Members agreed that producers could profitably co-operate in the purchase and sale of their produce and requirements, and especially in regard to co-operative wool sheds.

YORKETOWN, June 13th.—Mr. Rechner reported the death of a number of sheep through eating stinkwort. Other members stated that their sheep had frequently consumed quantities of this without ill effect. Mr. Heitmann exhibited a trombone, samples of millet, chillies, peanuts, and a luxurious growth of trefoil.

WESTERN DISTRICT.

COORABIE (Average annual rainfall, 11in. to 12in.).

June 6th.—Present: 10 members and two visitors.

Post and Shipping Facilities.—A resolution was adopted to the effect that the Branch should approach the authorities with the idea of having a post and telegraph office established at Coorabie. The Hon. Secretary (Mr. H. V. Hobbs) undertook, on behalf of the Branch, to communicate with the shipping companies trading with Fowler's Bay with the object of securing a reduction in landing charges.

Feed for Horses.—The Hon. Secretary drew attention to the scarcity of feed for stock, and suggested that the Branch should, as a body, ship their horses to Edithburgh, where good paddocking was available, until harvest time. It was resolved to call a special meeting to consider the matter.

ELBOW HILL (Average annual rainfall, 11in. to 12in.).

June 6th.—Present: 14 members.

Cultivation, Seed, and Stock.—Mr. H. Wheeler read a paper. He expressed the view that land in districts of light rainfall required more working than land in the heavier rainfall areas. In this district the farmer who put in 300 acres of well-worked fallow would do better than that man who scratched in 800 or 900 acres of stubble or grass land. The holding should be divided so that one-third could be cropped each year, the following rotation being adopted :—Fallow, wheat, and pasture. This ensured seeding being done at the right time, and was much easier on the horses, as the heavy ploughing would be done in the winter. The harrows should be put over the fallow as frequently as possible in the spring, and it should be cultivated after a heavy fall of rain. In the event of it not being practicable to leave out all the stubble, 50 or 60 acres of oats could be sown for hay. Every farmer should prepare a piece of land especially for the growth of seed, great care being exercised to keep the varieties free of smut and unmixed. The best varieties for this district were Gluyas, and for the lighter lands on the plains J4. German Wonder yielded well in the hills. He characterised it as shameful that the district had not in the past produced sufficient fat stock to supply local needs. He advised carefully conserving a paddock of 100 acres during spring to provide feed to top up 200 sheep or so when the stubbles were cleaned up. These would then be ready for market when prices were ruling high. Mr. A. Chilman though pigs should receive more attention. Mr. C. K. Jacobs quoted instances where crops on well-worked fallow were standing throughout the present dry weather much better than other crops. Mr. T. F. Brooks urged the advisableness of sowing good seed only. Gluyas was the best variety for this district. The Chairman (Mr. W. T. Cooper) strongly advocated sowing smaller areas better tilled. The Hon. Secretary (Mr. G. F. Wake) thought the frequent use of harrows on the fallowed loamy flats abutting the coast would consolidate the land. Mr. F. Spencer would sow the seed to a depth of 3in.

GOODE (Average annual rainfall, 12in. to 13in.).

June 10th.—Present: 12 members.

Scrub-Farming.—Mr. L. Will read a paper. For the homestead on a scrub block, he said, a site should be selected on a rise which would make a good catchment. A track should then be cut to the nearest point on the main road. On a plan of the holding the paddocks should be marked off as squarely as possible, and this should be used as a guide in laying out the block. The first paddock cleared should be that on the opposite side of the block to the prevailing winds; this would then act as a break when the others were being burned. Sufficient scrub for windbreaks and shelter should be left around the homestead, and also in the paddocks. in one or two corners if the land were firm; but if it were sandy, and liable to drift, narrow strips along the fences were preferable. When no natural water catchment was available 1 ton of iron should be put up as a shed roof. Mr. Hughes thought paddocks should be about 200 acres in extent. Mr. J. Nicholls strongly advised leaving belts of scrub on the holding. Rabbits would then seek shelter in these, and were more easily poisoned. Mr. W. Morcomb thought a five-wire fence the best and cheapest for sheep; larger meshed netting was too often destroyed by great stock. Mr. J. Whitelaw agreed.

KOPPIO (Average annual rainfall, 22·40in.).

June 11th.—Present: 10 members and two visitors.

Farm Accounts.—Mr. F. Brennand read a short paper. It was altogether too great a tax on the mind, he said, to attempt to memorise the many affairs connected with the working of a fair sized farm, and to a great extent it was unnecessary. The practice of recording transactions on odd pieces of paper, and reference to the heel of a cheque book, or a file of receipts, was equally unsatisfactory. To enable a farmer to correctly estimate the amounts of his profits and losses, it was absolutely necessary for him to keep books. He directed attention to the "Farmers' Simplex Bookkeeper," which he considered of service to the man on the land. Members agreed that it was very necessary that accounts should be kept of the proceedings of the farm.

PLOUGHING.—Members thought that as rain had held off so long, it was wise, where possible, to plough the land dry, provided it was worked again after rain. The general opinion was that the spring draught was far ahead of the bridle draught plough for this district.

MILTALIE Average annual rainfall, 14·55in.).

May 9th.—Present: 12 members and seven visitors.

MIXED FARMING.—Mr. W. G. Smith read a paper. The high prices which prevailed, and apparently would continue, for meat, wool, and skins, he said, should be an inducement for farmers to put portion of their fallow under fodder crops to provide feed for sheep, as well as improve the fertility of the soil. Continuing, the paper read :—"Thousand-headed kale is specially suited for our hill land, and if sown on fallow, benefits the following wheat crop. I have grown this for the last eight years, and find it a good summer fodder, making a good growth soon after the first autumn rains, when grazing is generally at its worst. It keeps up the milk supply, keeps the cows healthy, and the butter is good. It is also splendid for poultry when most other vegetation is dry. One acre of thousand-headed kale, with a little cocky chaff or other hard feed, will keep two cows well for the greater part of the summer. Field peas do remarkably well here, and it would be wise for the farmers in our hills to revise their farm management by including fodder crops in their practice. A good mixture to drill on fallow in August, with about 40lbs. or 50lbs. of super., is ¾lb. thousand-headed kale seed mixed with super. just before drilling, and ¾bush. field peas. The former protects the latter from wind. The cost of the seed of some fodders is rather high, so it is advisable to sow a small area for seed ; this will reduce the cost of putting in the fodder crop. Thousand-headed kale seed is cheap enough to the grower, as from seven plants after finishing with them as fodder, I gathered 19½lbs. of seed. Peas, lucerne, and other fodder seeds can be grown more cheaply than they can be bought. Lucerne will do well here in the hills, and every farmer should put in a trial plot of this. Last August I put in half an acre, without manure, and I am well pleased with the result, and intend to increase the area. To establish lucerne it is very important to give it a good start on well-prepared fallow, either sowing early in autumn or as soon in spring as the ground is warm enough to cause the seed to germinate. The seed should only just be covered. All stock must be kept off until the plant is well established. *Trifolium subterraneum*, of the clover species, but burrless, which is much grown in Mount Barker district, is worth a trial here. This makes good growth in early winter, and stands grazing well, and, according to my own experience, does not need cultivation. It should be sown early in March on grazing land. By cropping smaller areas and carrying out a system of more intense culture, a smaller farming plant is required, and an increased return received per acre all round. This district is capable of carrying a very much increased number of stock, and, if we are to be prosperous farmers, we must look to this. Farming is one of the most uncertain occupations when everything but the growth of cereals is neglected. We should go on increasing the number of stock according to the area of the farm, at the same time taking care to provide accommodation and not to over stock." The Chairman (Mr. P. G. Wilson) advised the growth of fodder crops. Mr. W. E. Hier considered that the practice of growing summer fodder on fallow was good. Mr. J. S. Jacobs believed farmers should go in for more intense culture. Many farmers would grow better crops if they would only farm systematically. He did not think such crops as kale should be grown on fallow, but should be sown in plots which were not used for wheat-growing purposes. A farmer should secure a good supply of water. Mr. A. M. Wilson thought that for the land to receive much benefit from a crop of peas they should be ploughed under instead of being eaten off. Mr. J. P. Story said sheep were very profitable on a farm, even if the farmer only got the skin at the end of the 12 months. Cows were also a payable adjunct, but should be in charge of the women folk. Some parts of the district were suited for fodder growing, but the plains, he thought, would not be found satisfactory. Mr. L. Aunger thought the country was not suited for growing summer fodder. As the farmer advanced he could go in for more intense culture, but he must do the most profitable thing first. Dairying might be all right in itself, but as a by-product for the farmer it did not warrant the extra labor and expense involved. A few fowls for home use were handy, but a farmer could not go in for producing eggs for market Mr. Smith, in reply, said that early fallow would grow peas to great advantage, especially for sheep raising. Such fodders as those helped to clear the land of weeds. Mr. Smith tabled a fine plant of kale that had been transplanted in October last. The plant showed fine growth, and was healthy and free from blight of any sort.

MITCHELL.

June 6th.—Present: nine members and two visitors.

Care of Machinery.—A short paper was read by Mr. Sinapius. He advised the provision of a shed with large pine uprights for preference, covered with straw, and then a layer of thatching grass tightly secured with wire, for farm machinery. An iron roof was less dangerous on account of fire, and would afford a water catchment, but was more expensive. Raw linseed oil should be applied to the woodwork of the machinery every other year, and to the nuts and bolts holding the binder fingers in place. Belts and leather work required a coat of neatsfoot oil annually, and belts could be prevented from slipping by being dressed with melted resin, to which had been added sufficient machine oil to keep it soft. Bolts on ploughs should be kept tight, and the bodies should be kept in alignment to prevent one furrow cutting more than the others. Axles should not be allowed to wear too much or the wheel boxes would be worn unevenly. Mr. Trimble advised repairing breakages before putting the machinery into the sheds.

Destroying Shoots.—In a short paper Mr. W. Ness advised cutting shoots and allowing them to remain on the stumps until the next growth was about 6in. high, and then burning them. Mr. J. H. Vigar had found the disc cultivator a great labor saver where shoots were numerous. Members generally favored fire-raking the stubble as one of the most effective ways of destroying shoots.

ROBERTS AND VERRAN.

June 2nd.—Present: 10 members.

Poultry.—In a paper dealing with this subject Mr. [illegible] A. Buttfield said—"In selecting sites for poultry-houses attention should be paid to—(*a*) The health of the fowls; (*b*) convenience of attendance; (*c*) protection from vermin. It is essential that the house and run be clean and free from damp. A dry and porous soil is naturally the best, but a wet and heavy soil will do if the land is well underdrained. The evils of the heavy soil are that it not only retains all the droppings on the surface, but, by retarding the percolation in times of frequent rains, it soon becomes covered with a coating of filth. The best situation is a slightly raised elevation, with the ground sloping gently from the building to ensure good surface draining. To get as much sunshine as possible it should have a southern aspect, a point or two to the east. Sunshine imparts vigor to the birds and stimulates egg production. The yard must be on the south side of the house, so that the fowls may get protection from the north-east winds. Permanent fowlhouses are not to be recommended for farms. They should be vermin-proof and so constructed as to exclude draught. Grain should not be kept in the fowlhouses, as it attracts vermin. Warmth, light, and cleanliness are chiefly to be considered in construction. The perches should be broad and not more than 3ft. from the ground, and movable. The nests should be in a more or less dark place and easily accessible to the fowls. The material for the bottom of the nests must not be of such a character as to stain the eggs. Moss litter laid about 6in. thick is a fine thing for the bottom of the house. Fowls confined in a run must have a plentiful supply of dust in order to keep themselves free from lice. On the farm movable houses can be used in the fields, but the movable runs can be dispensed with. If other farm stock be kept on the field great care should be exercised in moving the houses about constantly, so that no one stretch of land is fouled. A movable house that will shelter from 25 to 40 head of poultry can be kept to the acre if the house be moved a few yards each week. The birds scratching for food will improve the pasture by aerating the roots of the grasses, and they will spread the animal droppings and keep down insects. After harvest is gathered, until the land is ploughed again, poultry placed upon the stubble will get their own living. Fowls also destroy vast quantities of noxious insects and their pupæ. An excellent method of guarding poultry in movable houses and runs against the depredations of foxes is to run a wire along which a good watch dog can slide its chain across the field. Egg breeds have been produced for laying at the expense of sitting. They are really egg-producing machines. The average egg production is about 80 to 100 eggs per head of fowl per annum through the country. If egg production be pushed too far the constitution of the fowl weakens. The egg breeds are active and industrious, always foraging about or being on the look out for food. This is why they do best on extensive runs. In a state of nature birds have to work and scratch for their feed, and when they are in confinement this should be remembered. Among the egg breeds the following varieties are notable :—Minorcas, Andalusians, Spanish, Leghorns, Dorkings, Orpingtons, and Indian Game. The purpose of food is to supply heat to the body and the energy and force to enable the bird to perform its natural functions; to build up bone, muscles, tissues, feathers, and repair them as they slowly waste away; to provide a sufficiency of nervous energy and physical power to enable them to lay." Mr. F. Masters said poultry in this district should be bred for egg production, and not for table purposes. Members generally favored movable houses and thought egg production a payable adjunct to farming in this locality.

YABMANA (Average annual rainfall, 15·14in.).

June 6th.—Present : nine members and one visitor.

Method.—Mr. J. F. Robertson read a paper, in which he emphasised the necessity for a young man setting a definite objective before him. With determination of purpose, thoroughness, energy, and commonsense, he should be successful, and this applied particularly to life on the farm. Messers. J. N. McCallum and F. A. Beinke agreed with the writer of the paper.

Smut.—Members thought wheat sown on stubble land that had borne a smut-infected crop would very likely develop the trouble ; but this depended very largely on weather conditions. Pickling with bluestone was considered the best preventive measure. The method of pickling was not of such importance as the thoroughness with which the work was carried out. Badly infected wheat should not be sown. Mr. J. McCallum had used formalin, but had come to the conclusion that in the absence of plenty of moisture there was more likelihood of the grain malting than was the case when bluestone was used. Members agreed that the plant from good plump grain was more likely to survive a dry spell than that from shrivelled wheat.

YADNARIE (Average annual rainfall, 14·09in.).

June 6th.—Present : 15 members and nine visitors.

Engines on the Farm.—Mr. E. C. Stubing read a paper. He said—"The engine cannot be too highly recommended for work such as chaff-cutting, grinding, &c. The horseworks are used in many cases, but although the initial cost of an engine is greater it will prove the cheaper in the long run. For time and labor saving it cannot be beaten. For farm work the petrol engine is preferable to the oil engine, as it may be started at a moment's notice. The amount of power required is a very important consideration when purchasing. No matter what style of engine is to be purchased it is advisable to secure one somewhat larger than at first seems necessary. More work than was at first contemplated is sure to present itself. It is always well also to have a little power in reserve, because with an engine laboring under an excessive load the fuel consumed and wear and tear are very considerable. The style of engine selected is determined by the location and the nature of the work to be performed. If the engine is to be used in one place only a stationary type answers, but if it is to be used at various points a portable type, mounted on skids or wheels, is desirable." The majority of members favored a stationary petrol engine.

BUTLER, June 8th.—**Experimental Plots.**—A committee to supervise the manurial and wheat variety tests to be conducted by the Branch was appointed as follows :—Messrs. Bawden, Morgan, Parker, and Young.

Members thought that there was most likelihood of killing stumps when shoots were cut in January and February.

Grass.—A fine sample of Teff grass 2ft. high, planted on fallow in November, was tabled by Mr. Bawden. It was a good sheep and cattle fodder, and the animals were very fond of it.

MILTALIE, June 6th.—Under the title of "Why be a Farmer?" Mr. A. W. Wilson read a paper, in which he dealt with the advantages of the commercial life, the life of the artisan and that of the unskilled laborer, and contrasted them with those of the farmer. A person should not become a farmer simply because his father had followed that avocation, he said. Members discussed the paper.

SALT CREEK (formerly Utera Plains), June 6th.—A number of papers from the *Journal* were read and discussed. Members generally favored early wheats for this district. The best means of ridding the stubble of straw was to burn it. Several questions were discussed at length.

YALLUNDA.—CORRECTION *re* PEACH TREES.—[In the report of the April meeting of this branch, Mr. Fairbrother was said to have stated that peach trees died out in th's district. This should have read that peach trees were subject to "die-back."—ED.]

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BERRI.

May 9th.—Present: 15 members.

DECIDUOUS TREE-PLANTING.—An interesting and instructive paper by W. R. Lewis was, in the absence of the writer, read by F. R. Arndt. The paper dealt in a comprehensive manner with the planting of all kinds of deciduous trees. The writer recommended the planting of peaches and apricots on the looser soil of the holding, while pears, apples, and prunes should be planted on the stiffer land. Land that was liable to develop seepage was best planted with sultanas, while almonds and walnuts should have the driest situations. All land should be well graded before planting, and should be well ploughed. Where the land was hard gypsum should be applied to loosen it. The trees should be planted with care and headed low, as fruit was more cheaply gathered from low-headed trees than from standards. [This paper will be printed *in extenso* in a later issue.—ED.]

PEANUTS.—Mr. W. Morey exhibited a fine specimen of a peanut plant. He considered that for local conditions peanuts should be planted as soon as danger from frost was over, in rows 4ft. apart, the plants being 3ft. apart in the rows.

BORRIKA.

June 6th.—Present: 25 members and six visitors.

FALLOWING.—Papers on this subject were read by Messrs. J. E. Coombe and J. H. Gray. Mr. Coombe said fallowing should be commenced early, say in August. The land should be well turned over with a good mouldboard plough. The under surface was then exposed to the sun and frost, which sweetened it. Light sandy soil could be worked to a depth of from 3½in. to 4in. All the ground should be harrowed within a week of the time it was ploughed. It should be cultivated and harrowed after a good rain.

Mr. Gray said, "Fallowing is an important factor in wheat-growing. It has been proved in the older mallee districts that it will not pay to crop the land year after year without fallowing. Quite recently some statistics were published showing that the poor harvest returns in the Victorian mallee land were due to the farmers not adopting this system of cultivation. In the county of Weeah (mallee) the ratio of fallow to wheat was 11 per cent., and the average yield was nearly 5bush. In Borung (Wimmera) 95 per cent. of the land under wheat was fallow, and the average yield was 18bush. The majority of mallee scrub farmers have a knowledge of the advantages of fallowing; the trouble is that there are heavy expenditure and big liabilities to meet during the first few years; consequently the settlers crop their land several times in succession. While the wet seasons continued this kind of farming paid, but a dry season or two, such as we have just experienced, has proved disastrous. In my opinion it is a good plan to take off two crops and then fallow. By so doing one has a chance to get rid of some of the shoots by a stubble fire before leaving the land out for fallow. Fallowing is the systematic method of working the land to conserve the moisture from one season to the next, so that practically the crop will have the benefit of two years' rainfall. South Australian farmers were the first to cultivate the land in this way, and the farmers in other parts took the example from them. In the North the land is ploughed to a depth of about 4in. The harrows and cultivators are then used to destroy the weeds and maintain a fine tilth on the surface, to prevent evaporation of moisture. Sheep are run on the fallow to keep the plant growth in check. The cultivation of the fallow and the stock do the work of subpacking the soil. This heavy land sets firm after a rain, and where possible it is cultivated after a precipitation. The farmer in the mallee must adapt himself to local conditions. I do not think it wise to work the land down too fine with harrows, especially in this part, where there is so much sand. There will be trouble with drift if the land is left bare and worked fine. The ploughing should be commenced as soon as the seeding is over. The earlier it is ploughed the more moisture will be conserved. When the ploughing has been done early I would cultivate before harvest in the spring, and let the land remain rough. This will prevent it drifting. On our farm at Parilla they have not used the harrows on the fallow. A 300-acre paddock was ploughed in August, and only a small piece was cultivated. It was heavily stocked with horses to keep down self-sown growth of wheat, &c. It was sown about the end of June with early wheats, but the strong winds knocked the crop about. The average yield was 10bush., with about 2bush. or 3bush. waste. If the paddock had been sown with late varieties such as Marshall's or Yandilla King the yield would probably have been about 15bush. The best return from well-worked fallow in the Parilla district that I have heard of was 18bush. This was scoured with sheep when in fallow. In that part they have heavy flats, which do not drift, but the big sandhills drift badly. The low hills are not so bad. All bush must be cleared off and the drift given a clear sweep. It is difficult to get anything to grow on a drift mound. It may be necessary to grow some summer fodder, such as millet, sorghum, or maize, to prevent this drift, and this would provide feed for stock. This is what is termed "green fallow." At Roseworthy College tests have been made which show that results are better from bare fallow than green fallow; but conditions here are somewhat different. A heavy summer crop need not be grown on the fallow, but simply a light crop to prevent the drift. Summer fallow would be another means of dealing with the drift. It is best to plough the land after the harvest. When seeding is over, cultivate it lightly with a disc cultivator to conserve moisture. This implement, when worked in damp, showery weather, leaves sufficient plant growth to prevent drift. This method, of course, could only be practised where the land is not too dirty. It would be advisable to experiment in a small way to determine the point as to whether bare fallow is more productive than green fallow; whether it will pay to grow feed on the fallow, or allow it to remain bare and drift. It will be necessary to combine sheep-farming with wheat-growing, as the stock keep the weeds and self-sown wheat from seeding. The fallowing should be done when the land is in a moist condition to discourage takeall. Fallowing not only improves soil conditions, but enables the farmer to do some of the work, such as carting stumps in the winter, thus relieving the pressure of work in the seed time."

CLAYPAN BORE (Average annual rainfall, 16in. to 17in.).

June 3rd.—Present: 10 members and one visitor.

Farm Management.—Messrs. C. and S. Hill read a paper on this subject. It was bad policy to overstock, they said. Horses should have good, warm, roomy stables, divided into single stalls. If they were shut or tied up at night straw bedding should be provided in abundance. Small quantities of feed, at regular hours, were best. They preferred the large draught animal, which was much stronger than the lighter sort. Breeding was not profitable in this district with horses at such a low price. Care should be exercised to see that the animal's collar fitted well. White moleskin made the best lining. For a one-horse swing the distance should be 32in. from eyebolt to eyebolt, and for a two-horse swing 30in; this left the animals plenty of room to work. Farmers should keep a few sows; the Berkshire-Essex cross was preferable. Sheep greatly aided in keeping the fallow clean and provided meat for the household. Cows, poultry, fruit, and vegetables should also receive attention. Whatever crop was grown careful attention should be given the seed. Convenience of working should be studied; for instance, a race between the different paddocks and the water trough would save time and trouble. As each implement was finished with it should be cleaned, repaired (if necessary), and put under suitable cover. Mr. M. Robinson thought horses thrived better if allowed a free run in an open yard. They should have access to water only at definite intervals. Messrs. J. Entwistle, S. Gray, and E. Colwill also spoke and considered small paddocks approximately 200 acres in extent were essential to profitable working, and that each horse should be tied up in a separate stall. The last-named also made particular reference to thoroughly overhauling machinery at the end of each season, and keeping fowls away from stables and implement sheds, both of which could be made fowl-proof. Mr. J. Gray said it was essential to have implements in order and ready to commence work at once whenever the ground or crops were ready. "A place for everything and everything in its place" had always been his ideal. However, at times and under adverse circumstances it was difficult to reach this goal, and work was consequently delayed. He kept about 200 fowls, and although they were judiciously fed he had not found them very profitable. Every farmer should breed at least enough horses to replace losses from the team.

COONALPYN (Average annual rainfall, 17 49in.).

May 29th.—Present: nine members and two visitors.

Farm Buildings.—The following paper was read by Mr. E. E. Williams:—"Wherever it is possible, stone and iron buildings are to be recommended, as being most substantial and less liable to take fire. A more convenient grouping of the various sheds is made possible ; in fact, the greater portion may be included under one roof. With other work on hand, few are able to give the time to the erection of buildings of this class in the early stages of scrub farming, and as many of the buildings which are expected to be of a temporary nature often have to serve their purpose for a number of years, it might be well to confine my remarks to a few general observations as to position and design of farm buildings. In going from farm to farm one is scarcely likely to be struck with the idea that much thought has been given to the general plan of buildings to provide for convenience of working, or even to guard against the risks from fire. In scrub country it is a wise plan to place the house, &c., from 10 chains to 20 chains from any neighbor's land, to allow of a well-cleared break under one's own control. This will save much anxiety when the all too frequent bush fires are raging. Lack of this precaution has made it necessary for some to clear a break in an adjoining block for their own safety. It is not desirable to be in any way dependent upon a neighbor's good will in matters of this sort. Within one's own boundary, however, I would advocate some five or six acres as a protection from the wind, and would have all buildings on the eastern side of this windbreak—not in it. Having decided upon a site—which should cover enough ground to allow of all buildings being conveniently grouped—the next thing is to fix the spot for each building, insuring that the position of the haystack, chaffhouse, and stable shall be such as to give facility for handling feed and allowing for possible extensions, so arranged as to give protection to the horses from prevailing winds. This I regard as being the most important feature in connection with farm buildings. It is desirable that the harness-room be handy to the stable. Implement sheds should be as conveniently placed in relation to other buildings as a reasonable precaution will admit. Cow yards and sheds should be independent of other sheds. I have not attempted to describe what I should regard as the best design for buildings. It is safe to assume that when a farmer is in the position to erect ideal farm buildings he will give effect largely to his own ideas ; but it often happens that in the rush of new settlement, buildings are dumped down here, there, and everywhere in the most inconvenient way imaginable."

On June 5th a social gathering was held, there being a large attendance of members and friends. A paper on the subject of "Hobbies" was read by the President (Mr. A. J. R. Gurner), and Mr. H. J. Finnis (of the Department of Agriculture) delivered an address on the organization of the Agricultural Bureau. He urged the advisableness of Branches undertaking experimental and demonstration work, and mentioned various spheres in which the Bureau could do effective work.

FORSTER (Average annual rainfall, 10in. to 11in.)

June 6th.—Present: five members.

Waste on the Farm.—A paper under this heading was read by Mr. C. Hayman. He urged the need for systematically arranging the farm work. Inside work, such as bag-mending, bolt-cutting, &c., should be left for a rainy day. Expensive implements should not be left unprotected from the weather. Most farms here had a bore or well on them, and the landholders should have vegetable gardens and lucerne plots. A great deal of grain was wasted, he said, through the present method of harvesting, and he expressed the hope that shortly the portable thresher would be in more general use. This would leave straw to tide the stock over a period of drought. At seeding time wheat was wasted through cracked and shrivelled grain being sown. It would pay the farmers to co-operatively purchase a grader to obviate this. Mr. J. Searle thought it impracticable to use the thresher in this district at present on account of the difficulty in using the binder on land with stumps on it. A garden would be found payable, but he would not grow lucerne. Mr. W. J. Sears agreed. He would prefer to sow oats and wheat mixed for feed. Mr. T. Searle said lucerne well looked after would be found profitable.

LAMEROO (Average annual rainfall, 16·55in.).

June 6th.—Present: 18 members.

Sheep on the Mallee Farm.—Mr. W. Vivian (of Victoria) contributed a paper, which was read by the Hon. Secretary. Sheep on a mallee farm, he said, assured a regular income. They improved the land for cropping and lessened the cost of working the fallow. If the mallee were cut in November or December, so that the shoots developed when the feed was dry, the sheep would eat these, and thus obviate a good deal of trouble in killing shoots. Overstocking should be avoided. Where the climate was cool, and the grass good for wool, the best sheep for the mallee farmer was the bold, strong-constitutioned Merino ; the heavy-necked, wrinkled, small sheep should be avoided. When a market was available for lambs, good results could be secured by crossing the Merino ewes with Lincoln rams. Shropshire and Leicester lambs were not so good in the wool as the cross recommended above. The Romney Marsh was also good. Dipping, which did not cost ½d. per head when the animals were treated off the shears, was strongly recommended. Mr. E. J. Troubridge, who had 400 sheep on his holding, agreed that these animals paid. Mr. Jericho, sen., was doubtful if sheep would prove profitable. The cost of fencing would outweigh the returns. The land would drift, he said, if sheep were run over it, and the mallee shoots might prove injurious to the animals. Mr. Townsend advised keeping sheep, and Mr. Campbell recommended growing root crops and lucerne. Mr. Leckie said almost all varieties of grasses would grow in this district. The Chairman (Mr. A. J. A. Koch) had kept sheep all the while he had been in the district, and they had been profitable. Overstocking, he said, should be avoided.

Feeding off Wheat.—During July and August, when the plant had a good root system, was recommended as the best time to feed off wheat crops. Lucerne should be planted at the present time with a light sowing of oats or wheat.

MANTUNG.

May 7th.—Present: 11 members and one visitor.

Clearing Scrub.—Mr. E. Hannaford read a paper, in which he said—"For clearing scrub under the present conditions I prefer a 10ft. roller with a team of 10 or 12 bullocks. Horses suffer too much from the jarring of the roller, and there is also a danger of their being staked. The best roller for ordinary work is an old boiler cylinder, about 4ft. high, with the usual frame attached. For the bigger scrub of this district a cylinder standing about 5ft. to 6ft. high, with the frame built so that it can be adjusted to the height of the timber being rolled is best. I am not in favor of using a traction engine for the big timber on account of the difficulty of getting it over the trees and stumps, also on account of the expense of the engine; the average settler is not prepared to face this. Logging is another system which I think is much to be preferred to axe work for big timber. A framework built on two strong wheels, not more than 8ft. apart, with strong timber built in the usual roller pattern, will answer the purpose very well. A logger with a team on either end does not answer in this district, unless tracks are cut for the inside team. Either the 6ft. roller or the framework on two wheels is most suitable for high, heavy timber. For the light mallee the usual 4ft. roller is preferable. In all cases it is necessary to have plenty of strength." Mr. Nobes, in discussing the subject, said a 4ft. cylinder roller left too many snags; for large scrub he would use a bigger cylinder. Mr. A. Tonkin preferred a log for large scrub; Mr. L. J. Pearce concurred. Mr. J. P. Tonkin advised an 8ft. cylinder roller, Mr. E. Tonkin a 6ft. cylinder, and for small scrub Mr. Baker thought a 3ft. roller satisfactory. A double team log, he said, was not a success.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

June 6th.—Present: 25 members and five visitors.

Care of Harness.—Mr. F. C. Thiele, in a short paper, recommended hanging harness in the stables on hooks 7ft. from the ground. Leather punches, assorted copper rivets, and some good harness leather should always be kept on hand. Working harness should be greased with mutton tallow a year or two old and free from salt twice a year. If fresh mutton fat were used, oil should be put with it. The dressing should be applied hot, on a warm day, the harness being left in the sun until the leather absorbed all the grease. Buggy harness should be washed with warm water, dried, and then rubbed well with neatsfoot or vacuum leather oil. Several members preferred dressing their harness with whale oil. This should be done directly after harvest and seeding.

MONTEITH (Average annual rainfall, 14in. to 15in.).

May 29th.—Present: seven members and eight visitors.

Dairying on Swamp Land.—The Hon. Secretary (Mr. C. A. Bentley) read a paper There was ample room for improvement in the way farmers here treated their dairy herds, he said. Protection from the weather, by rugging or housing the cows and providing them with shelter-breaks, should be afforded. Only by attention being given to these matters could a good milk supply be assured. Too much feed was wasted under the feet of the cattle with the present system of feeding long hay in the paddocks. All maize, hay, &c., should be put through a chaffcutter. If chaffing were not practicable the feed should be placed in racks set over long mangers, into which all leaf and waste hay would fall. Whilst it was advisable to graze as much as possible, lucerne and clover should not be grazed, as the cows were liable to be blown. Barley was very satisfactory as winter feed. For summer grazing the millets and *panicum* were useful, and for late summer amber cane sorghum was available. Whilst lucerne could be cut and fed in the summer, as much as possible should be made into hay for winter feeding. Lucerne chaff and crushed oats given twice a day made good feed for cows during the coldest part of winter. Each animal's milk should be weighed and a record kept of the result. The milking Holstein cows were doing well of late in this district, but he would prefer to see the introduction of the Ayrshire, which could be crossed with either the Holstein or the Jersey and produce a suitable hardy animal. A lengthy and interesting discussion followed the reading of the paper.

MORGAN (Average annual rainfall, 9·29in.).

June 10th.—Present: seven members and two visitors.

Ensilage.—The Chairman (Mr. R. Wohling) reported having secured satisfactory feed for pigs by making pit ensilage of weeds, &c., growing on his holding.

Mallee Farming.—A visitor, Mr. Plue, gave an interesting and instructive address on the methods of cultivation adopted on the West Coast. He mentioned the difficulty that was experienced in ridding the land of mallee shoots, and expressed the opinion that many farmers were endeavoring to clean and crop too large an acreage.

PARRAKIE (Average annual rainfall, 16in. to 17in.).

June 6th.—Present: 12 members and three visitors.

Fallowing.—Mr. S. R. Good read a paper. He said—"Fallowing should be commenced as soon after seeding as possible, say about the first week in July, and finished about the middle of August. It is far better to fallow 300 acres and work it well than to plough 500 acres and not work it at all. I favor the use of a six-furrow share plough, cutting not more than 7in. furrows, and ploughing at least 4in. deep in wide lands. The fallow should be harrowed down as soon as possible and then crossed with a disc cultivator. Should there be a fall of rain just about hay time, the harrows should be put over the fallow again. Frequent and good working is necessary." Mr. Temby favored the share plough, as he could pull out a greater quantity of stumps with this implement than if using the disc plough. He would use disc implements to work back fallow. If the fallow were at all dirty the disc ran through it better than the tine cultivator. Weeds grew better on early fallow, and the farmer could then put more time on the ground later on. It was more profitable to have a small quantity of clean fallow than a big area of dirty and badly-worked ground. Mr. Diener spoke strongly on the advisability of farmers confining themselves to small areas of fallow rather than working an area beyond the possibility of being handled thoroughly. Poor harvest returns were largely attributable to poorly-worked ground. He advised good working, whatever the implement used might be, and heavy manuring. Mr. N. J. Good doubted if fallow in this district was going to prove a success until sheep were put on the land.

Seeding.—Mr. J. Parkinson read a paper, in which he said—"If farmers graded their seed thoroughly every year a much higher standard of wheat would be the result. Carmichael's Eclipse and Marshall's No. 3 are wheats which should suit this district. When sowing after rain a bushel of graded wheat per acre is enough, but for dry sowing it is advisable to sow a little more, as some may not germinate. Whether sown wet or dry, all wheat should be pickled and allowed to stand three or four days to dry. A solution of about ½lb. bluestone and 10galls. of water is strong enough to kill smut, and this will not retard the germination of the grain as much as a stronger solution. I prefer dividing the bags into two butts and dipping them into the solution. This is quite as effective, quicker and much easier than the floor method. About 60lbs. of super. per acre is ample on light sandy soil, especially when the crop is intended for grain. The growth of the plant on sandy country with a heavy application of super. is so soft that it is very easily affected by hot winds, &c. On firm red flats it is preferable to apply a little more, *i.e.*, about 70lbs. or 80lbs. per acre." In preference to a grader, Mr. J. Temby would use a winnower with a fairly open screen. This was a quicker method and answered the purpose in so far as making a good sample of seed was concerned. His best results were from ground sown with ½cwt. super. per acre, but a lot depended on the season. With good fallow, and in good seasons 1bush. seed and 1cwt. super. could safely be used. Mr. C. Heinzel would use a stronger solution of pickle. He always pickled on the floor, and had never been troubled with smut. He sowed ¾bush. of late wheats and 1bush. of early varieties. He would apply super. heavily on good fallow. He favored the use of the grader. Last season a good deal of shrivelled and pinched grain was harvested, and

25 per cent. of this was taken out by the grader. Mr. N. J. Good favored sowing ¾bush. seed and ¾cwt. super. With heavy seedings numbers of the heads were small and yielded less. Mr. Diener favored the use of the grader. The quantity of super. applied should be regulated according to the manner in which the ground was worked. One hundredweight could be put on good fallow, and ½cwt. on stubble or rough ground. The Chairman (Mr. A. J. Beelitz) favored bone manure. He preferred the grader to the winnower, for removing drake. In reply Mr. Parkinson thought the grader was better than the winnower, as everything but the plumpest and biggest grain was removed. The plump grain always produced the best plant.

PARILLA (Average annual rainfall, 16in. to 17in.).

June 4th.—Present: 17 members and two visitors.

Fallowing.—Mr. H. G. Johnston read a paper on this subject. After a holding, in new country, had been worked for four or five years, he said, it should be divided into smaller paddocks and fallowing practised. By this means the heaviest work was done during the winter months, when the ground was in a better state for ploughing than after harvest. Ploughing should commence as early as possible after seeding, and in land likely to be affected with takeall. it should be finished by the end of August. The depth of working should be 2½in. on the sandhills, and from 3in. to 4in. on the flats. Large stumps should be picked up and the land cross harrowed. After rain the flats could be cultivated and harrowed, but on no account should they be worked when dry. Sandhills did not require cultivating if sheep were run on them. Without these animals it was impossible to keep the land clean. Mr. J. Roachock advised deeper cultivation of sandhills than was recommended in the paper. Mr. Shannon was opposed to dry cultivation. Sandy land would drift when it was worked, he said. Mr. Tee advised working the land irrespective of whether it was dry or wet. Mr. C. Foale advised shallow ploughing on the sandhills. Mr. J. Foale agreed, and said sheep saved a good deal of work. Mr. E. J. Kerley advised deep ploughing in sand, with which Mr. C. E. Moyle agreed.

PINNAROO (Average annual rainfall, 16·74in.).

June 15th.—Present: 14 members and two visitors.

Harvest Report.—At the close of the last harvest the Branch circularised practically every farmer in the district with the idea of securing reliable information with regard to the yields of different varieties of wheat on stubble, fallow, and new land. From the information secured the Hon. Secretary (Mr. P. H. Jones) extracted the following data. The figures are instructive, but will, of course, be of greater value as the experience of future seasons is added. The results over a number of years tabulated in like manner will enable the deduction of reliable and valuable facts as to the behaviour of different wheats in the district:—Yandilla King—Five plots on stubble yielded 9·7bush. average (included in this was one plot on oat stubble, which yielded 13bush.); five plots, fallow, 9·81bush.; one plot, grass, 9·13bush. Federation—Seven plots, stubble, 6·3bush.; five plots, fallow, 8·59bush.; one plot, new, 7bush. Gluyas—Three plots, stubble, 8bush. Walker's Wonder—Two plots, stubble, 11·5bush.; two plots, fallow, 16·53bush.; Golden Drop—Four plots, stubble, 6·79bush.; one plot, fallow, 8·5bush. Cumberland—One plot, stubble, 5bush.; three plots, fallow, 11bush.; one plot, grass, 3bush. Early Baart—One plot, stubble, 7bush.; one plot, fallow, 7·41bush. Lots—One plot, stubble, 11bush.; four plots, fallow, 9·12bush. Budd's Early—Three plots, fallow, 12bush. The results of the following varieties were also handed in, each one plot lots:—Marshall's—New land, 6·5bush. Red Gamma—Stubble, 7bush.; fallow, 6·9bush. Hungarian—Fallow, 4·82bush. Crossbred 53—Fallow, 10·5bush. King's Red—Fallow, 6bush. Comeback—Stubble, 7bush. Taragon—Stubble, 3bush. Bluey—Fallow, 9·1bush. Blue Federation—Stubble, 7bush. Le Hugeunot—Stubble, 9bush. Leather Head—Fallow, 8bush. Bearded Gluyas—Stubble, 7·4bush.; grass, 3·4bush. Bunyip—Grass, 6bush.; fallow, 6bush. Viking—Fallow, 7bush.; grass, 6·75. American No. 8—Fallow, 6bush. White Tuscan—Fallow, 7bush.; stubble, 10bush. King's Early—Fallow, 6bush. Correll's No. 7—Grass, 6bush. Bayah—Fallow, 15bush. Thew—Fallow, 5bush. The last two mentioned were grown on the one farm under exactly similar conditions.

WILKAWATT (Average annual rainfall, 16in. to 17in.).

June 6th.—Present: 20 members and six visitors.

Reclaimed Swamps.—Mr. W. J. Bowman read a paper describing matters of interest which had come under his notice during a trip to the reclaimed swamp areas at Murray Bridge.

Farm Management.—The Hon. Secretary (Mr. W. J. Tylor) contributed a paper. He mentioned several matters which, if given proper attention, would augment the profit derived from farms in this district. The utmost care, he said, should be exercised by the farmer in the selection of his machinery. Field trials were an excellent means of education in this direction. It was unwise to attempt to plough, for instance, with an implement that repeatedly fouled and was quite unsuited for the work. In the near future, he thought, it would be necessary to sow fallow land only in this district. During the past two seasons the climatic conditions had pointed strongly against working up stubble land for seeding. The practice he advised was to plough to a depth of 4in. (the depth being increased yearly), and allowing the land to remain rough until September, when sheep could be turned on the fallow. In the event of a good rain in September, the ploughing could be crossed with a tine cultivator to half the depth of the fallowing. Sheep would pack the soil and tend to prevent drift. In the event of rain after harvest, the harrows should be put lightly over the ground, and the tine cultivator should immediately precede the drill, which should be followed by the harrows. Graded seed, free from smut, should be sown. Mr. D. F. Bowman agreed that it would become necessary to practise fallowing in the near future. Mr. M. Neville advocated fallowing to as great a depth as possible. Mr. McAvery favored a plough with eight-furrow frame, carrying five furrows. This took the ground well, and went through the rubbish.

WYNARKA.

June 13th.—Present: 11 members and four visitors.

Light Mallee Land.—Mr. C. Schultz, in a paper dealing with farming in light mallee land, advised rolling and clearing as much as possible at the beginning of operations and cropping an area of new land each year. The latter would yield better than the stubble, and could be put in more cheaply. After the crop was taken off a log should be dragged over the straw and a fire put into it on the first suitable day. After the burn the land should be lightly worked, and if it were quite dry or damp enough to ensure germination, late wheats should be drilled in April. The best implement was a skim plough or tine cultivator, a good set of harrows being used after the drill. The amount of super. applied and the seeding should be liberal; this would ensure a good burn, which was frequently worth several bushels of wheat per acre in the succeeding crop. From 70lbs. to 100lbs. of super. with 45lbs. to 50lbs. of late wheat on new land, slightly less on stubble, and 55lbs. to 65lbs. of early wheats, according to how they stooled, were the best quantities. After two crops of wheat had been taken off the land, 1bush. oats with about 70lbs. to 80lbs. of super. should be drilled in. This could be grazed or reaped, and providing the majority of the stumps were dead, the paddock could be left out to grass for several years. Following this the land should be ploughed after seeding to a depth of 2in. to 3in., harrowed and cultivated when damp. It was unwise to fallow paddocks carrying many green shoots. Mr. Schultz did not think it advisable to fallow land after it had been cropped for only two years, but advised two stubble burns, cutting the shoots the following year, and burning in February. Members were of the opinion that land treated in this way would yield as well as fallow land with dense shoots on it.

LAMEROO, May 9th.—**Demonstration Plots.**—Mr. A. J. A. Koch had arranged to conduct manurial tests with three plots—No. 1 treated with Beats All, No. 2 with Beats All and 20lbs. super., and No. 3 treated with 60lbs. super. Mr. Bull was treating three plots with lime, Beats All, and super. and lime respectively.

WAIKERIE, June 7th.—It was reported that wheat crops were looking well, but rain was needed. Pruning had commenced, and a few settlers were preparing for planting. A strange weed was tabled, and subsequently forwarded to the department for identification.

SOUTH AND HILLS DISTRICT.

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

June 15th.—Present: 90 members and visitors.

Annual Social.—The annual social of this Branch was held in the Coromandel Valley Institute. The chair was occupied by Mr. W. L. Summers, and the following toast list was honored :—"The King," "The Parliament" (proposed by Mr. A. W. Carlos and responded to by Mr. G. R. Laffer, M.P.), "The Department of Agriculture and Advisory Board" (at the instance of Mr. T. C. A. Magarey, and replied to by the Hon. T. Pascoe, M.L.C., Minister of Agriculture, and Mr. G. G. Nicholls, Secretary Advisory Board), "The Blackwood Branch" (proposed by Mr. Geo. Jeffrey and responded to by the Chairman, Mr. W. L. Summers), "Neighboring Branches" (Mr. C. G. Savage, and replied to by Messrs. Chapman, Cherry Gardens; T. B. Brooks, Clarendon; and W. H. Hughes, Longwood), "The District" (Mr. A. J. Penno, and responded to by Mr. F. Dall). and "The Ladies, Committee, and Performers" (Mr. R. J. Wilson. responded to by Messrs. L. V. Porter and L. G. Moody).

CHERRY GARDENS (Average annual rainfall, 35·03in.).

June 2nd.—Present: 12 members.

Fallowing.—Mr. G. Hicks read a paper. As the holdings in this district were too small to allow of fallowing in spring, he advised working the land, say in January or February, and allowing it to remain rough until the first rains fell in winter. It should then be worked down loose, and ploughed again before the drill. Cultivating was unsatisfactory if the weeds were thick. Last year he fallowed in February and ploughed again in May. One bushel of White Tuscan wheat, 1bush. of Algerian oats, and 1cwt. of bone manure were drilled in, and the crop cut 3 tons of hay per acre. Land that was not fallowed, but otherwise worked and seeded similarly, returned 1½cwts. per acre. As a general rule, in a dry season, the more the land was worked at seeding the better. It was mentioned that by practising thorough cultivation, Mr. Hicks had secured very good returns from land which previously had yielded disappointing crops. Mr. J. Lewis said it did not pay to work the hills lands whilst they were very wet, as the stiff clay, with clay subsoil, set very hard, and baked. Mr. C. Ricks thought fallowing assured a better seed bed, and a better and cleaner crop was the result. The writer of the paper, in reply to questions, said the land should be worked to a depth of about 5in. during September or October. A light working should follow a fall of rain.

HARTLEY (Average annual rainfall, 16in. to 17in.).

June 3rd.—Present: 13 members.

Horses.—The subject of the management of horses was dealt with in a paper by Mr. J. Stanton. The disposition of the animal should be studied, he said, and kind treatment would be found the best means of getting the maximum out of the beast. It was only in exceptional cases that a horse was naturally vicious or stubborn, generally bad horsemanship was responsible. An animal that shied should be induced to inspect the object which frightened it; this would most likely obviate a recurrence. Defective eyesight was the most frequent cause of this trouble. Kicking was a habit hard to break. Young horses, therefore, should be well handled about the legs before the harness was put on them. As a horse that once ran away could not be afterwards trusted, it was unwise to let it stand without tying it up securely. Jibbing was often caused by bad breaking, overloading, or bad driving. A horse that was a confirmed jib was practically useless. Hanging back in the stable could be cured by fixing a rope under the horse's tail, bringing the two ends forward, crossing the rope over the animal's back, and tying it tightly in front of its breast, so that there is no slack. The rope should then be run through the nose strap of the halter, fixed to the neck, then through the ring on the manger, and tied to the rope across the breast. The beast should then be frightened and so induced to pull back. Members agreed that it paid the owner to treat his horses kindly.

Afforestation.—This formed the subject of a paper by Mr. A. Wundersitz. It was the duty of every landholder, he said, to give the matter of tree-planting his attention. A few gums should be planted each year on all holdings, and district councils would be well advised to consider the advisableness of planting roads and reserves. As this district was rather dry, June was the best month for planting. The land should be ploughed, the holes for the trees having been sunk, about 18in. deep, two months before. The bottom of the holes should be well loosened with a sharp crowbar, and the trees should be placed about 30ft. apart. An old super. bag should be supported on four stakes to protect the young tree from the wind, and it should also be attached to a stake. Up to a height of 10ft. or 12ft. the trunks of the trees should be kept free of branches. The corners of paddocks, and sandy or stony spots should be planted. Members thought the district rather dry for tree-planting; it would take a considerable time for them to grow to useful size.

KANMANTOO (Average annual rainfall, 17·90in.).

June 6th.—Present: 16 members and two visitors.

The Agricultural Bureau.—Under the title of "Help Received from the Agricultural Bureau," Mr. W. G. Mills, who has been associated with the Bureau practically since its inception, read a paper, in which he said this institution was responsible to a large extent for the up-to-date farming methods adopted in this State. The practice of conducting experimental plots, he said, was a very desirable one. It was principally by comparison that they could determine the best system of working, and the Bureau meetings enabled comparisons to be made. He referred to the practice of distributing seeds among Branches, which he thought had served a good purpose in the early history of the Bureau. This had led him to take an active interest in grasses, and he had successfully established *Trifolium subterraneum*, as well as other clovers, on his holding. He had also demonstrated that the native bunch grass would readily grow from seed collected and sown through a drill.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

June 6th.—Present: 10 members and four visitors.

Irrigation.—The meeting was held at the homestead of Mr. W. Nicholls. The chief matter of interest was a large dam, estimated to hold 2,000,000galls., being excavated to hold water for irrigation purposes. It was proposed to water 10 to 12 acres of land, by means of gravitation, from this.

Fodder for Dairy Cows.—In a paper on this subject Mr. A. F. Furniss said—"For about three months, say from the beginning of October till Christmas, there should be enough grass, &c., to keep a cow in full milk with very little, if any, bran and chaff. After that, as a rule hand-feeding has to be resorted to more or less if the cow is to be kept up to concert pitch, and my idea is that that should be the aim in order to prolong the milking period and get the best results. In August, or early in September, I sow mangolds to make fodder for the following winter, or the leaves may be used during the summer if short of other food. White carrots are also good food, and may be sown at this time. Towards the end of September I sow maize, which should be ready to cut for green fodder in January, about the time the natural pasture is going off. Maize can be planted any time till the end of January, or even later, and will provide fodder until well into June unless frosts are too severe. I always sow in drills about 2ft. 6in. apart but close in the drills, as feed and not grain is required, and cultivate between the rows with a scuffler. When the stalks become too hard for the cows to chew they may be chaffed up, and every particle will be consumed. I do not recommend maize solely at any time, and when chaffing it up I always mix in some oaten hay. Amber cane and Planter's Friend may be sown in the spring, and can stand drought better than maize, and will grow again when cut. Of the two I prefer Planter's Friend. Barley and rye can be sown in February or March, and by June should be ready to cut. As a rule I sow them when the ground is quite dry, and then they are ready to come up with the first rain. Rye will grow on poorer ground than barley but it is not so much relished. Swedes are a good root crop for winter use, and may be sown early in the year until, say, the end of February, and will produce good bulbs by winter. Thus, with maize and sorghum from January till June, then barley, rye, mangolds, and swedes through the winter and up till early September at least, provision is made for the greater part of the year. If the ground is available, say, after a late crop of potatoes, it might be well to sow it with barley. It will move slowly during the winter if the ground is rich, and in the spring will be fit to cut after the March sown barley is all gone. It is as well to grow as much hay as possible, more particularly to mix with the maize. With the succession of fodders I have mentioned it is quite possible to do without a silo, though it would be handy sometimes to tip surplus green stuff into. I turn all my surplus clover, rye grass, and any other herbage into hay, and it is readily eaten by horses or cows, or it may be chaffed along with the oaten hay. Lucerne will grow all right once it gets well started, but farmers in this district like to change the crops pretty often. There may be other fodders or grasses that will do just as well as the ones I have mentioned, but I have not had personal experience of them. Many think that growing feed for cows all the year round is too much bother, and would rather buy bran and chaff, or follow the still easier plan of letting the cows roam around to pick up what they can on the roads. Cows so treated have no chance to show what they can do. For the want of a continuous supply of good food the majority of the cows in this State, if not all Australia, fall far short of what they are capable of producing. In the course of time large quantities of milk will be forwarded to the city from the hills to meet the ever-growing demand. The growing of fodders, which can be so easily done in the hills, will tend to keep up that regular supply which is so desirable. The only feed I ever have to purchase is bran to mix with the chaffed maize and oaten hay."

Broom Millet.—The following paper, written by Mr. Coles, was compiled from information supplied by Mr. J Rook, of the Royal Institution for the Blind:—"The soil most suitable for the growth of millets is an alluvial or rich strong loam capable of being worked up fine; but almost any well-wrought farm lands which will carry good maize, potatoes, and the ordinary crops will answer very well. It is necessary that the land for this crop, especially if intended for broom-making (and I shall keep this latter point in view all through my remarks), should be well prepared and clean. It should have one or two good deep ploughings and cross ploughings with harrowings to pulverise it and bring it to good tilth. Sowing may commence any time after the beginning of September, or whenever is the local time for maize planting, and be continued as opportunity permits all through the spring and into the summer. As the early sowings give the finest crops, both in quality and quantity, it is in the interest of the farmer to endeavor to get the crop planted and well established as early in spring as he can. The land having been well and finely wrought and rolled down, the drills may be struck out 3ft. or 3ft. 6in. apart and about 4in. deep. The seed does not require a large amount of moisture to germinate it. but if the season inclines to be dry the drills should not be kept open or needlesly exposed to the sun or drying winds before sowing and covering in. About 6lbs. to 10lbs. of seed per acre should be sown. After the drills are closed a light roller should go over to help retain any moisture in the land. Care should be taken to let the seeds drop regularly in the drills, the plants being about 3in. apart in the rows should the land be in good heart. If, however, the land is inclined to be light or poor, less seeds must be put in so that the plants may be farther apart, otherwise they will not develop freely and the heads will not attain the desired length and perfection which alone brings the highest price in the market. At the same time, whilst length of head is desired, coarseness must be avoided. As soon as the drills or rows are discernible the crop should be cleaned by running the scarifier or horse hoe between them, and working close up to the plants. This will not merely kill the weeds, but will greatly stimulate the growth of the young plants, and is very important at this time. Then, should the plants stand too thickly, the weaker ones may be pulled or cut out with the hoe. With a thick growth the heads are frequently stunted and inferior. When the young plants are 6in. to 9in. high they should be hilled in the same manner as maize or potatoes. Whether this is done at one operation or two may be left to the discretion of the grower, but it is necessary that it be done early (earlier than is usual with maize) and before the surface roots extend between the rows, which they do very quickly. If possible this should be done immediately after rain, or whilst the dew is on the crop in early morning. The intervening space may be occasionally scarified to keep the ground clean and the soil loose and retentive of moisture. This may be continued during the time the crop is making its growth. Beyond the foregoing no special attention is required until such time as the crop is arriving at maturity, usually four or five months after sowing. *Harvesting and Curing.*—In selecting the time for cutting this crop the grower must exercise as much judgment as in determining the day on which he shall cut his wheat or hay. Presuming the crop is being grown for manufacturing purposes, it will reach maturity when the seed is properly formed and filling, but before the grain hardens or the seed stems color. Should the seeds, either by negligence or accident, be allowed to fully ripen, as in the case where the crop is grown specially for seed grain, the seed stems become pithy and brittle and of little or no value for manufacturing purposes. In the work of cutting, boys of 14 or 15 years may be employed, and are usually as good and quick as men. The heads are bent down by the cutter and taken off with a strong knife, leaving about 5in. to 6in. of stalk attached. A laborer follows and cuts down the stalks from which the heads have been removed, and they are left on the ground until ready for burning or otherwise disposed of. The heads, when cut, are placed in small thin heaps, on some of the fallen stalks in preference to the ground, and allowed to dry in the open air for a couple of days, or if the weather permits until they attain a bright silvery color; on no account should they be cut or handled whilst damp. Field curing may be facilitated by frequent turning. The crop is then removed to a large shed and stacked until it is convenient to strip off the seed. Should the weather not allow of the crop being cured in the field it must be carted to the shed and spread out on benches or straddles, or the floor, say, about 6in. deep, and then turned every day. When cured in this way, and some maintain that it is the correct method, the crop retains a light-green tint, which is desired by some manufacturers, who will sometimes pay a higher price for it, according to the special trade or work. It is not usual, however, to adopt this plan unless weather conditions compel it, because a very much larger shed is required for this purpose, and a great deal of extra labor is entailed. But whatever system of curing the grower may select, he must make every effort to give his product a fine color, as it so largely influences its selling value. Hackling or stripping the seed off the heads is the next operation. For this a small machine, consisting of a rapidly revolving roller or drum studded with iron teeth about 2in. long, is necessary. The heads are not put through the machine in the same manner as the cereal crops with the ordinary thresher, but are merely inserted to the depth requisite for cleaning off the seeds and then withdrawn, the work being effectively and expeditiously done, and the pins or stems remaining unbroken or otherwise injured. The cost of this machine or hackler is from 55s. to 70s. for handpower, and from £8 10s. to £10 for horse. The former is sufficient for a farmer growing only a few acres, and the work of hackling may be done at any time when most convenient, provided the heads are dry enough. The heads being now ready for sale are tied in bundles or put into bales and pressed. The size of bales most liked are those weighing 400lbs. to 500lbs. each."

MOUNT PLEASANT (Average annual rainfall, 26·37in.).

June 12th.—Present: seven members.

Dry Bible.—This subject was dealt with in a paper by Mr. F. Langsford. He related his experience with this disease some years ago, when he lost 13 cows out of a herd of 14. He expressed the opinion that there was no cure for the trouble, but it was easily prevented. The cause was that the digestive organs of the cows were ruined when they were calves by being fed on improper food, such as milk from which the butter fat had been extracted. The preventive measures to adopt were to give the calf a fair percentage of new milk or a good substitute until it was three months of age, and then put it on good succulent pasture. The provision of bone meal was a sure means of warding off the disease. Eighteen years ago he first purchased a supply of bone meal for his cows, and he had not lost a beast from dry bible since. If an animal was badly affected with the trouble he would give it one pint of meal mixed with ½gall. new milk per day for three or four days. Oatmeal gruel should also be fed at times. However, the impaction should be forestalled by the animals being given about a tablespoonful of bone meal in a feed of bran and chaff, the quantity being increased as the cattle took to it. Subsequently a supply could be kept in a box or tin in a dry place, where the animals could get it at will. The symptoms of the disease were that the droppings were softer and of darker color than usual; the animal moved as though injured across the loins; it would then lie down with the head to one side, and chew continuously. The next stage was paralysis, the animal lying flat on one side; death subsequently ensued. Mr. T. Miller attributed dry bible to dry feed and insufficient water. A few pounds of ensilage fed daily would prevent the disease developing. The Chairman (Mr. H. A. Giles) thought it unnecessary to feed whole milk to calves after three weeks if pollard were judiciously mixed with the skim milk.

PORT ELLIOT (Average annual rainfall, 20·33in.).

June 20th.—Present: nine members.

Fruit and Afforestation.—Mr. J. Brown read a paper, in which he said there was a large extent of country, commencing two or three miles inland from the coast, in this locality eminently suited to fruit and forest tree cultivation. The gullies, particularly, were well adapted to fruit growing. It would be necessary to grub and thoroughly plough land for orchard purposes, and the use of the stump-jump implement was advised on land being prepared for forest trees. Three varieties which might well be grown were *Pinus insignis* (for apple cases, &c.), Tasmanian blue gum and sugar gum (for posts).

Experimental Plots.—Mr. Hargreaves undertook to conduct experiments in the manuring of fruit trees.

URAIDLA AND SUMMERTOWN (Average annual rainfall, 44·25in.).

June 1st.—Present: 14 members and two visitors.

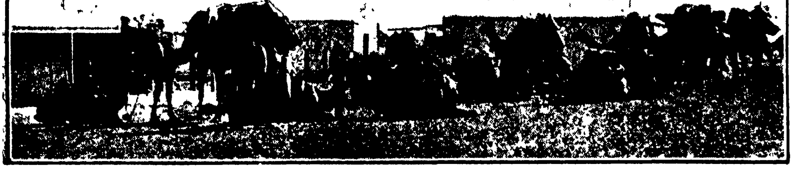
Strawberry-Growing.—The Hon. Secretary (Mr. G. Prentice) read a short paper. The Melba variety of strawberry, he said, was the only suitable sort for this district. They could be grown equally well on old or newly broken land, responded well to irrigation, cropped well through the summer, *i.e.*, from November to March, were of good color, and sold well. Land for this crop should be worked deeply and to a good tilth. One hundredweight of bonedust should be applied to every five rods of land, although well-rotted stable manure would answer well. After the first year a light dressing of sulphate of ammonia should be applied; this resulted in more and larger fruit and bushes. The best runners of the first year should be planted in rows 2ft. apart with, say, 1ft. between the plants. The ground should be kept well hoed, to destroy all weeds. Just before the crop ripened, the spaces between the rows should be covered with straw; this would keep the berries clean in the event of a heavy fall of rain. Picking should be frequent; the fruit being carefully placed in punnets, packed in crates, and marketed immediately. Mr. E. Hawke thought super. and bonedust mixed the best manure for this crop. Melba was the best variety for this district. Mr. Bonython concurred. Mr. Johnson thought sulphate of potash might be applied with advantage.

WOODSIDE (Average annual rainfall, 31·95in.).

June 3rd.—Present: nine members.

Lamb-Raising.—Mr. W. King read the following paper:—"In the Lower North, South, and South-Eastern districts, on a farm of 160 acres of arable land, there should be a flock of 200 breeding ewes. Two crops of lambs per year could be obtained by keeping the ewes in good condition, by allowing them 1½cwts. of chaffed hay each, principally in the beginning of winter. The farm should be divided into eight blocks of 20 acres. Each year there could be 40 acres of fallow, 40 acres of hay crops, and 20 acres of peas. The peas, after the first year, could be grown on half of the hay ground, and the hay grown on the fallow. After the first year, very little, if any, artificial manures would be required, as the land, being so heavily stocked, would be kept in good heart by the droppings. Half of the fallow ground should be sown with sorghum or rape, and fed off by the sheep, which would also clean up the hay and pea paddocks. With what they could get in the paddocks, and with good management in keeping them well supplied with water, and changing their paddocks occasionally, at the outside 20 tons of hay only would be required. Under these conditions there should be no trouble in raising good lambs. Where sufficient water is obtainable for irrigation double the above number of ewes could be kept by growing summer crops." Mr. S. Pearson thought two lambs per year was too much to expect from the ewes, unless they had abundance of feed. Mr. H. Rollbush thought the idea a practicable one for farms on which irrigation could be practised so that the ewes could have plenty of green feed to nourish their summer lambs. Mr. J. Lauterbach thought the idea of dividing the farm up into small paddocks a very good one, as in dairying this scheme had proved itself very profitable. In replying, Mr. King said that it had been proved that sheep could be fattened on 1lb. of chaffed hay per day, or 350lbs. a year per sheep. With reference to farms on which irrigation could be carried out, he would suggest that 10 acres be set aside for this purpose. Lucerne was best for summer feeding. In the case of ewes becoming too old to stand another year's breeding, he suggested fattening them in the summer on the lucerne, and replacing them by younger sheep.

NARRUNG, June 6th.—Pigs.—Members favored the medium-sized, quick-maturing pigs. Fresh blood of the Middle Yorkshire, Poland-China, and Berkshire breeds had just been introduced by several members, and the results would be watched with interest In the past the most popular pig in the district had been the Berkshire and Berkshire-Essex cross.



Camel Team, Oodnadatta.

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